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Air Pollution Translations:

a bibliography with abstracts –

Volume 1

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service

173

AIR POLLUTION TRANSLATIONS:
A BIBLIOGRARHY WITH ABSTRACTS –
VOLUME 1

Office of Technical Information and Publications
Air Pollution Technical Information Center

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Consumer Protection and Environmental Health Service
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AIR POLLUTION TRANSLATIONS: A BIBLIOGRAPHY WITH ABSTRACTS — VOLUME 1

INTRODUCTION

This volume of *Air Pollution Translations: A Bibliography with Abstracts* is the first document in a continuing series of compilations presenting abstracts and indexes of translations that have been analyzed and accessioned by the Air Pollution Technical Information Center (APTIC). It comprises the results of scientific research and other studies on air pollution that have been published in foreign languages. Of the 558 items cited, 511 are from the Russian language, 129 from German, 6 from Polish, 4 from Czech, 3 from French, 2 from Chinese, and 1 each from Dutch, Japanese, and Spanish.

The abstracts are of published translations in the APTIC data bank through accession 10,000. Most were translated and published expressly for the National Air Pollution Control Administration (NAPCA) in *U.S.S.R. Literature on Air Pollution and Related Occupational Diseases* by B. S. Levine, the cover-to-cover translations of "Staub-Reinhaltung der Luft," "Hygiene and Sanitation," and the "VDI-Richtlinien" (German Engineering Society Guidelines), all by the Israel Program for Scientific Translations. Volume 2, which is already in preparation, will present unpublished translations accessioned by APTIC. Subsequent volumes will document both published and unpublished translations.

The entries in this volume are grouped into 13 subject categories. In each category the entries are arranged in numerical order, using the APTIC accession number. Each entry starts with a letter denoting its subject category, followed by its accession number. All personal authors are cited.

Titles are copied exactly as they appear in the original translations, with necessary editorial corrections supplied in brackets. The letters CFSTI, at the end of the citation, indicate that the publication can be obtained from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia, 22151.

Abstract length is limited as strictly as possible without sacrificing essential information. Erroneous statements in the abstracts are errors of the original publication or translation.

The volume includes an Author Index, Language Index, and Subject Index, in which the entries are cited by a letter-numeral accession number. The letter designates the section of the bibliography in which the abstract can be found. Within a section, the abstracts are listed in ascending, but not necessarily consecutive, numerical order. As an example, the number M-4155 refers to section M, Basic Science and Technology, and to accession 4155 within it.

The Author Index lists senior authors as well as coauthors. The Subject Index lists descriptors (taken from the APTIC microthesaurus) and open-ended terms that most nearly indicate the essence of the document. Cross references have been made when the descriptor consists of more than one significant word, when the most significant word does not appear first, and to group generically similar concepts. For example, the term "aromatic hydrocarbons" will be cross referenced under "hydrocarbons."

A-4052

Haddad, Ricardo and John J. Bloomfield
ATMOSPHERIC POLLUTION IN LATIN AMERICA. [La Contaminacion Atmosferica en America Latina.] Translated from Spanish. Bol. Ofic. Sanit. Panam., No. 57, p. 241-249, Sept. 1964. 11 refs. (Presented at the Interregional Symposium on Criteria for Air Quality and Methods of Measurement, Geneva, Switzerland, Aug. 6-12, 1963.)

Latin America is an area which is experiencing a very rapid population and industrial expansion. Although this growth is very irregular, the cities which exceed a million inhabitants and the industrial concentration in them is growing yearly. This phenomenon has resulted in serious problems of air pollution in Sao Paulo, Brazil, Santiago, Chile, Mexico City, Mexico, which are in need of further investigation and control as quickly as possible. There are potential problems in Buenos Aires, Argentina, and in all those large metropolitan centres which are growing and industralizing rapidly. The situation created in Lima, Peru, because of the fishmeal industry, seems to be fairly well controlled. The greatest necessity is to train personnel capable of conducting studies in measuring air quality and controlling the contamination of the air. There is also a necessity to create a consciousness of the seriousness of the problem among government authorities and the public in general. It is hoped that the future development of the Institute of Occupational Health and Air Pollution Research in Santiago, Chile, will contribute effectively to the achievment of these objectives.

A-4172

Gushchin, G. P.
ATMOSPHERIC OZONE AND ITS EFFECT ON SOME VEGETATION SPECIES. In: Part 2 - Atmospheric Ozone. Data presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 229-232, 1966.
CFSTI: TT 66-62191

The problem of the effect of atmospheric ozone on man, plant and materials is briefly reviewed. Harmful ozone concentrations can be expected in the atmosphere at certain heights. This is of particular importance to present day and future aviation, in view of the fact that external air is used for passengers and crew. Special measures for the protection of passengers and crew become necessary at 10 km and higher. Decomposing effect on rubber is also demonstrated, although ozone affects various rubbers differently. Some types of tobacco leaves are sensitive to ozone effect and could serve as indicators.

A-5183

Pokrovskiy, V. A.
SOME PROBLEMS OF CURRENT IMPORTANCE IN PRESENT-DAY INDUSTRIAL TOXICOLOGY. Gigiyena Truda i Professional' nyye Zabolevaniya, Vol. 11, p. 17-20, 1963. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 3-11, Feb. 3, 1964.
CFSTI: 64-21463

The paper discusses some problems of industrial toxicology appearing at the present level of development. In the number of most pressing problems the author includes investigation of early manifestations of poisoning and of adaptation shifts in the organism, mastering new methods of toxicological research and analysis and bringing into line the levels of maximally permissible concentrations set up by industrial and sanitary toxicology. Besides, special attention is drawn to the great significance of toxico-hygienic characteristics of industrial poisons. (Author's summary)

A-5235

Mazitova, R. M., V. N. Okhotskaya, and B. I. Puchkin
OLFACTORY SENSE AND ITS SIMULATION BY MODELING. In: Olfactory Sense and its Modeling. [Obonyaniye i yego modelirovaniye.] Siberian Affiliate, Novosibirsk, "Nauka" Publishing House, 1965, Chapt. 5, p. 106-114. 6 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 12p., Dec. 7, 1966.
CFSTI: TT 66-35417

The authors discuss present-day functional methods of the peripheral part of the olfactory organ. These models correspond to the original and are more accessible to study than the olfactory analyzer. The usefulness of the models discussed is determined not by their absolute correctness or correspondence to the olfactory analyzer, but by whether they can offer a more rational approach to the investigation of olfaction, or help in the elicitation of the true nature of olfaction. A model may provide the basis for the study of many aspects of olfaction. The adsorption theories served as the basis for the majority of known models of the olfactory analyzer. Illustrations of the Dravnieks, Moncrieff, and a simplified model are included. The so-called "electric rose" created by Rosano and Skeps and the "electronic blood hound" are discussed. Models of the olfactory analyzer may find widespread use in the chemical, food and perfume industries, medical diagnosis, the deodorization of conditioned air, the localization of leakage in gas-pipe systems, etc. It is also pointed out that recent research in this field makes it possible to evaluate objectively the quality and intensity of various odors, and even obtain some idea as to the nature of odors, although the mechanism of perception of odor has not been definitely clarified as yet.

A-6572

TERMINOLOGY IN AIR PURIFICATION. [Begriffsbestimmungen Reinhaltung der Luft.] Translated from German. Verein Deutscher Ingenieure-Richtiinien, No. 2104, 13p., May 1962.

Large sections of the public and many members of economic enterprises, municipal communities, public authorities and lawmaking bodies are concerned with the purification of air. The "Committee on Air Purification", established by the Society of German Engineers, has prepared scientific-technical specifications with the collaboration of experts in all affected fields which serve as basis for measures against air pollution. Because it appeared necessary to create uniform definitions of the terms utilized in the entire field of the problem of air purification, the Chairman on Air Pollution charged the "Committee on Dust Technology" (of the special VDI group on dust technics), with defining these terminological concepts. This is an enlarged and revised reissue of the VDI Specifications No. 2104. The terms are arranged alphabetically within five groups: I. Occurrence and emission of dust, aerosols and gases. II. Distribution and deposition of dust, aerosols and gas. III. Effect of dust, aerosols and gas. IV. Measuring techniques and special technical questions. V. General.

A-8225

Vytchikova, M. A.
AIR IONIZATION IN GYMNASIUMS. Gigiena i Sanit., 24(1): 83-85, 1959. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 173-177, Jan. 1961.
CFSTI: TT 61-11149

The electrical properties of atmospheric and indoor air are of hygienic interest as factors affecting the state of the environment. Air ionization in different gymnasiums was measured accompanied by determinations of carbon dioxide content and by recording the meteorological conditions. Observations were made in each gymnasium prior to the beginning exercises and upon their termination. Generally, in the course of four series of exercises, lasting 1-1/2 hours, the concentration of light ions in the gymnasiums decreased. In all cases the positive ions prevailed; the coefficient of unipolarity varied in an indeterminable manner. A comparison of the variations in the number of light ions with changes in the meteorological conditions and the carbon dioxide content pointed to some definite interrelation between these factors. It was noted that the number of light ions was usually in some inverse proportion to the relative humidity and to the CO_2 concentration. In a gymnasium where heavy athletic exercise was conducted the number of light ions in this gymnasium may be explained by the fact that it was located in a semi-basement. Comparing the results of measurements of ionization with the sanitary conditions of the air in the gymnasiums surveyed, it can be stated that a poorer sanitary air condition was accompanied by a decreased number of light ions in the air, and that the greatest loss of light ions was recorded in gymnasiums with the poorest sanitary air condition.

A-8260

Radczewski, Otto Ernst
THE SIGNIFICANCE OF FINE MINERAL PARTICLES IN NATURE AND TECHNOLOGY. (ORGANIZATION AND ARRANGEMENT OF THE EXHIBITION OF PULVERULENT MATERIALS.) Staub (English translation), 27(5): 1-4, May 1967 18 refs.
CFSTI: TT 67-51408/5

The instructive exhibition of pulverulent materials at a convention in Vienna from Sept. 29 to Oct. 1, 1966 is discussed. The exhibition was put together over many years. Samples, photographs and reprints affording an introduction to the relevant bibliography were arranged in the following groups: morphology; methods of dust analysis; coal and ore preparation; iron and metals; rocks and earths, mineral powder; fiber dusts; dye powders, technical organics; nutritive flours; dust in the respiratory organs; and dust of streets, rooms, and industry. Determination and representation of fine minerals was primarily served by the microscope. SiO_2 is used as an example of the significance of fine-mineral precipitations. In dust technology and hygiene, it is known and feared as the cause of silicosis, appearing in the form of fine quartz or cristobalite. The metamorphic qualities of quartz in the manufacture of silica bricks by firing depend upon particle size, particle shape and structure.

B-4082

Lampert, F. F.
PREVENTION OF AIR POLLUTION IN GAS EQUIPPED APARTMENTS (WITH REFERENCE TO THE PROPOSED SANITARY REGULATIONS FOR GAS EQUIPPED RESIDENCES). Gigiena i Sanit., 28(4):60-62, April, 1963. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 94-97, 1966.
CFSTI: TT 66-61429

Gas is gradually replacing hard fuel in the U.S.S.R., which affects favorably the population's living conditions. Lack of development or improvement in gas burners has resulted in frequent air pollution in houses and apartments which have been equipped with gas. Gas burning generates such air pollution products as carbon monoxide, carbonic acid, hydrocarbons, etc.; it also raises the surrounding air temperature and humidity, easily detected even after the gas has been used for 1 hour. Comparative studies conducted in differently planned gas-equipped living quarters indicated that where living rooms were connected directly with the kitchen, intensity of air pollution with carbon monoxide and other products of gas combustion was greater than in apartments in which the kitchen was isolated from the living room. These facts clearly point to the channels along which modern engineers, planners, architects, and hygienists must direct their attention for the rational solution of the air pollution problem in future construction of gas equipped residential houses and apartments. Therefore, it is urged that construction and planning engineers in sanitary organizations should make proper use of the available home gas equipment. It is also suggested that for the purposes of proper sanitary safety, gas burning utilities, particularly those used for water heating, should be equipped with automatic safety devices which would stop the gas flow as soon as unfavorable conditions developed in the exhaust flue.

B-4097

Perov, O. B. and D. M. Boris
DUST DISCHARGED BY PLANTS PRODUCING "COLD ASPHALT", AND ITS EFFECT ON THE SANITARY CONDITIONS OF RESIDENTIAL LOCALITIES. Gigiena i Sanit., 28(7):62-64, July 1963. 1 ref. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 185-187, 1966.
CFSTI: TT 66-61429

"Cold asphalt" is a viscous mixture of finely ground rock and bitumen or asphalt. "Cold asphalt" is manufactured in stationary plants or production departments which use the same production methods; this type of asphalt can also be prepared in the open, creating unfavorable sanitary hygienic working and living conditions in nearby residential and industrial areas. Data obtained in connection with studies at asphalt processing plants show that in dry weather the density of dust in the air over the rock crushers and dryers amounted to 1360-1550 mg/m^3. The air over the mixers at times contained 2400 mg/m^3 rock dust. The air of territories surrounding plants producing dry asphalt was severely affected by the generated filler dust. Data obtained by the present authors show that through the year, and depending upon the wind pattern, the greater part of sedimented dust was found in the 100-500 m zone.

B-4098

Gofmekler, V. A., M. D. Manita, Zh. V. Manusadzhants, and L. L. Stepanov
CORRELATION BETWEEN 3,4-BENZPYRENE AND CARBON MONOXIDE CONCENTRATIONS IN AUTOMOBILE EXHAUST GASES. Gigiena i Sanit., 28(8):3-8, Aug. 1963. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 187-193, 1966.
CFSTI: TT 66-61429

One of the most widely occurring cancerogenic substances in ambient air, 3,4-benzpyrene, is also a component of automobile exhaust gases. Seemingly, there exists a correlation between the formation and discharge of 3,4-benzpyrene and carbon monoxide, as both may result from incomplete liquid fuel combustion. A better understanding of this 3,4-benzpyrene and carbon monoxide correlation in dealing with the problem of sanitary protection of atmospheric air was the aim of this investigation. Concentrations of 3,4-benzpyrene in auto exhaust gases were determined by the spectral-fluorescent method. Carbon monoxide concentration in automobile exhaust gases ran in correlation with the concentration of simultaneously occuring 3,4-benzpyrene; accordingly, CO concentration can be used as an indicator of the rate at which 3,4-benzpyrene is discharged into the atmosphere with the automobile exhaust gases. Automobiles with properly adjusted carburetors generated and discharged into the atmospheric air less carbon monoxide and less 3,4-benzpyrene. The highest concentration of 3,4-benzpyrene and of carbon monoxide was discharged with exhaust gases coming from automobiles operated at low rpm, usually at the time of starting or accelerating. Atmospheric air pollution with 3,4-benzpyrene and carbon monoxide can be reduced substantially as follows: by controlled carburetor operation at all times, particularly when starting and moving into line with the traffic, and most of all by keeping the carburetor clean and well adjusted; by reducing to a minimum the number of stops and starts at cross sections and light signals. This can be done by proper manual and signal traffic regulations and by instituting overhead and underground auto routes which would allow automobiles to travel without making many stops.

B-4108

Yanysheva, N. Ya., I. S. Kireeva, and N. N. Serzhantova
3,4-BENZPYRENE IN CRUDE OIL AND IN BITUMINOUS PRODUCTS. Gigiena i Sanit., 28(11):71-73, Nov. 1963. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 266-268, 1966.
CFSTI: TT 66-61429

The present authors investigated the 3,4-benzpyrene concentrations in crude oil tars of different trademarks. The investigation aimed at finding which of the products contained the least amount of 3,4-benzpyrene so their use could be recommended in the place of other products which contained higher cancerogenic hydrocarbon concentrations. The investigation included crude oil, tar and pitch products trademarked BN-IV and BN-V, obtained from cracking residuals BN-V produced by the Kherson plant. This plant processed crude oil coming from the Ukraine and partly from Povolzh'ya. Samples for the investigation came in a variety of forms of processed crude oil, such as crude oil asphalt resulting from direct vertical crude oil distillation, and cracking residuals resulting from processing crude oil breakdown products. The composition of products resulting from direct vertical crude oil distillation depended largely upon the nature of the crude oil, and the composition of cracking products characterized by high content of aromatic polycyclic hydrocarbons is determined basically by the production technology. Trademarked crude oil bitumens are distinguished by their melting point and viscosity. Results indicated that even the maximal 3, 4-benzpyrene concentrations found in the crude oil tar residues were considerably below the maximal concentration of 3, 4-benzpyrene found in coal pitch. Therefore, it appears that replacing the coal tar pitch as a binder by crude oil tar residue should reduce considerably the amount of cancerogenic coal products in coal dust brickettes. It should be remembered, however, that crude oil tar residue binders may contain cancerogenic substances other than 3, 4-benzpyrene, the concentration of which may be different in different types of the crude oil binders. In view of this, final recommendations for the use of the safest crude oil residue binders of different trademarks should be based on experimental studies with animals.

B-4114

Dmitrieva, N. V., A. I. Kukhovkaya, and I. S. Khazanov
METHODS FOR LOWERING SOLVENT CONCENTRATIONS IN THE AIR OF PLANTS ENGAGED IN DRY CLEANING CLOTHES. Gigiena i Sanit., 28(12):71-73, Dec. 1963. Translated from Russian by B. S. Levine in U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 298-301, 1966.
CFSTI: TT 66-61429

Indoor air pollution with organic solvent vapors in dry cleaning plants constituted a hazard to the health of the workers. The following air pollution sources were found in dry cleaning plants: open manual method of applying solvents in the spot removing department; non-observance of safety regulations; primitive and manual technological procedures in loading and unloading the rotating cleaning drums; unorganized leakage; etc. The method used in unloading dry cleaned clothes from the solvent containing drums constituted a particularly hygienically unfavorable condition. Comparative evaluation of equipment and machines used showed that highest solvent vapor air pollution was noted in dry cleaning plants equipped with U. S. A. machines. Therefore, it is recommended that the use of American machines be discontinued. Prevention of air pollution with solvent vapors in dry cleaning plants can be attained by the following means: (a) strict adherence to most advanced technological defatting processes; (b) elimination of all leakage sources, especially in the pipes and conduits; (c) installation of a properly planned up-to-date overall ventilation system supplemented by the installation of local exhaust devices at points of workers'exposure to the inhalation of the solvent vapor polluted air. The present practice of manual spot removing from clothes in the open should be unconditionally prohibited; appropriate local exhaust ventilation devices should be installed; and the rate of fresh air inflow should be increased. Employees of dry cleaning establishments should be examined periodically by industrial medical personnel and persons unfit for such occupation should be replaced.

B-4287

Baranov, A. P.
NEW SOURCES OF ELECTRICAL ENERGY FOR SHIPS. [Novyye Istochniki Elektricheskoy Energii dlya Sudov.] In: Shipbuilding House, Leningrad, U. S. S. R. 1965. Translated from Russian. Department of the Navy, Washington, D. C., 120p., 1966.

This book, which is the result of an analysis of a great many articles and much information which is scattered and narrowly specialized in nature, as well as of some work done by the author, has attempted to provide basic, and systematized, information on questions dealing with theory, design arrangements, the characteristics of thermoelectric, thermal emission, magnetohydrodynamic, electrochemical generators, and the possibilities of using these generators on board ship.

B-4398

Walter, E.
THE DUST SITUATION AT MIXING PLANTS USED IN BITUMINOUS ROAD CONSTRUCTION IN WESTERN GERMANY. STAUB (English Translation), 26(11):34-40. Nov. 1966. 6 refs.

Extensive investigations have given information on the amount of dust produced in different working places, from mixing plants to road construction using bitumen. It is shown that workers not only employed in plants using silica are exposed to silicosis hazards, but also when additives containing silica are used. This is also valid for basaltic rocks or blast furnace slag. As a result of dust emission, according to type of rock, dust hazards can also exist in the environment of a plant. By taking special measures in the selection of plant sites and chimney heights, by adapting the throughput to the efficiency and capacity of dust removal plants, and particularly by selecting raw material, it is possible, to a large extent, to reduce any serious effects. Machinery and technology also require the use of new methods. (Author's summary)

B-5184

Trefilov, V. N. and M. D. Skanavi
HYGIENIC CHARACTERIZATION OF LABOR CONDITIONS IN THE CHLOROPHOS INDUSTRY. Gigiyena Truda i Professional'nyye Zabolevaniya. Vol. 11, p. 41-43, 1963. Translated from Russian, Joint Publications Research Service, Washington, D. C., p. 12-16, Feb. 3, 1964.
CFSTI: 64-21468

Analysis has revealed that the atmosphere of the chlorophos production department is contaminated mostly by chloral, dimethylphosphate, and chlorophos vapors. Judging by the available clinical data the detected concentrations of organophosphorus compound (chlorophos and dimethylphosphite) vapors reached dangerous levels, which, as it was noted, gave rise to the development of intoxications. In reconstruction and erecting new analogous plants it is recommended that particular attention be attached to proper sealing of equipment and to elimination of manual operations. It is also suggested to make provisions for automatic pouring of chlorophos, its measuring, weighing and washing of barrels to be effected in special shielded chambers. (Authors' summary)

B-5266

Svetozarova, O. I., V. V. Zhdanova, and E. P. Levashova
STUDY OF THE POSSIBILITY OF OBTAINING GAS TURBINE FUEL FROM THE PRODUCTS OF CATALYTIC CRACKING AND COKING. Tr. Tekhnol. Pererabotki Neftii Gaza. Neftekhimiya Gostoptekh-Izdat., No. 12, p. 61-68, 1963. 7 refs. Translated from Russian. Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio, 9p., Dec. 23, 1964.

The physical and chemical properties of distillates, obtained in catalytic cracking of gas oils at the Grozny refineries and the products from contact coking of heavy petroleum residues were studied. The distillates obtained in catalytic cracking of light raw material, can be used as low-ash, low-congealing components of the fuels for gas turbines. The yield of distillate fuels amounted to 43 to 52.5 percent of the cracked raw material. For getting light, low-ash gas turbine fuels with traces of vanadium, the process of coking heavy petroleum residues should be accomplished with recirculation. In contact coking of raw material with recirculation of the sulfurous pitch, tar and cracking residue, the yield of low-ash gas turbine fuel amounted to 45, 56.2, and 64.4 percent.

B-5714

Huber, E. W.
CO-FORMATION IN MOTOR VEHICLE ENGINES. Translated from German. Automobiltechnische Zeitschrift, Vol. 62, p. 320-325, Dec. 1960. 10 refs. (Excerpt from a Lecture at the Eighth International Congress of FISITA, The Hague, 1960.)

A study was made of whether and under what conditions the CO-formation of an engine is reduced. Although the same CO-content is obtained with a good mixture with the same air-fuel ratio as with a bad mixture, the fuel portion in the mixture and thus the CO-content can be reduced considerably with a good mixture. A partial-load operation is possible with complete fuel consumption which reduces the CO-content to about one-tenth of that of the customary throttle control. Investigations with a compression-ignition engine with diesel fuel and with gasoline operation in the case of an excess of fuel as well as with an NSU Wankel engine are reported.

B-6304

Skobunov, V. V.
USE OF AMMONIA IN STUDIES OF THE DISSIPATION OF ADMIXTURES IN A FLOW. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR. p. 74-79, 1962.
CFSTI: TT 66-51043

The reproducibility of diffusion experiments was studied by determining the distorting effect of measuring tubes simultaneously placed in the flow on the concentration fields. The sources were located at the point of separation of the boundary layer and the quantities of air and ammonia remained the same in all experiments. The presence of several measuring tubes arranged in a series has practically no effect on the distribution of the concentration fields for ammonia. The points obtained in working with only one tube lie on the same curves as those obtained with the simultaneous presence of four tubes in the flow. This method was used for direct determination of the width of the zone contaminated by dust or gas liberated by point sources. For this purpose, glass tubes moistened with orthophosphoric acid were placed in the model at different distances from the source. The reaction of ammonia with the acid forms a coating on the tubes (ammonium phosphate), the width being greater on measuring tubes which are located at greater distances from the source. The full width of the dispersion trace is measured by an ordinary scale ruler. The method elaborated for studies of the dissipation of admixtures (gases or dust) by means of ammonia is applicable in any aerodynamic scheme for the ventilation of open pits and mine workings. The method is also suitable for point and continuously distributed sources of dust and gases of stationary and nonstationary types.

B-6561

SOURCES OF AIR-POLLUTING SUBSTANCES. [Katalog der Quellen luftverunreinigender Stoffe.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2090, 11p., Dec. 1961.

Enumeration of principal sources of air polluting substances is given. The sources are arranged by industry branches and/or the field of their occurrence. This specification also lists VDI Clean Air Committee specifications which are published in English by the Division of Air Pollution, U. S. Public Health Service.

B-6571

THE RESTRICTION OF CHLORINE GAS EMISSION. [Gasauswurfbegrenzung Chlor.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2103. 13p., Jan. 1961. 8 refs.

The information contained in these specifications is grouped under the following major headings: (1) Technology (involving methods of producing and processing chlorine), (2) Processes for extraction of chlorine, and (3) Restrictions of chlorine gas emissions.

B-6578

RESTRICTING EMISSION OF DUST FROM MANUALLY-OPERATED CENTRAL-HEATING BOILERS, CAPACITY 600,000 KCAL/HR AND LESS, FIRED WITH SOLID FUELS. [Staubauswurfbegrenzung Handbediente Zentralheizungskessel für feste Brennstoffe mit Leistungen bis etwa 600.000 kcal/h.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2115, 13p., June 1961. 10 refs.

This specification is applicable to warm-water and low-pressure central-heating boilers with furnaces for solid fuels, capacity 600,000 kcal/hr and less, operated manually under natural draft (no blower). The aims are to characterize the causes leading to the formation of dust (fly-ash, cinders, and eventually together with soot and other non-gaseous and combustible components) from central-heating boilers for solid fuels; to recommend measures for the reduction of dust emission; and to establish guidelines for the restriction of permissible immission.

B-6579

RESTRICTING THE EMISSION OF FUMES FROM DIESEL-ENGINES. [Begrenzung der Rauchentwicklung von Dieselkraftfahrzeugen Rauchursachen, Messverfahren, Abhilfemassnahmen.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2281, 12p., Nov. 1961. 8 refs.

This specification reviews the composition of diesel exhaust fumes, the causes for excessive development of fumes from diesel engines as well as measures for control. The testing method and the permissible tolerance are given.

B-6582

RESTRICTING EMISSION FROM GAS GENERATORS IN COKE GAS PLANTS. [Auswurfbegrenzung Generatoren Kokereien und Gaswerke.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2290, 19p., June 1962.

The purposes of this specification are: to describe the operation of gas generators and to analyze the factors influencing the emission of gas and sulfur dioxide; to indicate measures for reducing the emission of dust and sulfur dioxide; and to establish conditions and guide values for restricting the emission of dust and sulfur dioxide.

B-6909

Trakhtenberg, I. M. and K. I. Luchina
"MERCURY DANGER" AND ITS PREVENTION IN SECONDARY SCHOOLS. ["Rtutnaya opasnost'" i ee profilaktika v usloviyakh obshcheobrazovatel'nykh shkol.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(12):411-414, Dec. 1965. 14 refs.

The potential dangers and means of preventing micromercurialism in secondary schools were discussed. In the last 10 years, health workers in different cities have reported facts indicating the potential danger of micromercurialism in standard secondary schools. Contamination with mercury vapor was detected in several physics rooms at schools as well as in the laboratories attached to them. Mercury contamination is possible also in chemistry rooms. We sampled and analyzed for mercury 626 air samples and 342 samples of different building materials taken from several schools. The principal source of air pollution with mercury in the chemistry rooms was found to be the mercury vapor liberated during the demonstrations of the decomposition of mercuric oxide and of metallic mercury as an example of a liquid metal. The dissociation of HgO to metallic mercury and oxygen takes place at a high temperature, thus facilitating the intensive evaporation of mercury and the liberation of large amounts of its vapor into the air. The laboratories often keep compounds that are not on the standard lists, including mercury nitrate which liberates mercury vapor even at ordinary temperatures.

P -7299

Gorelova, D. N. and P. P. Dikun
THE DETECTION OF 3, 4-BENZPYRENE IN SOME SPECIES OF SMOKED FISH. (FLUORESCENCE-SPECTRAL ANALYSIS). Vop. Onkol., 4(4):398-405, 1958. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 126-134, March 1960.
CFSTI: TT 60-21188

An investigation was made of the presence of 3, 4-benzpyrene in smoked fish commonly used in the U.S.S.R. The fish were subjected to saponification. Chromatographic partitioning was made with a 50 g column of aluminum oxide. The unsaponifiable fraction dissolved in 30 - 50 ml of benzene was adsorbed by the aluminum oxide column. Smoke used for processing fish contained 3, 4-benzpyrene, which, together with other substances contained in the smoke, was deposited on the walls of smokehouses and on the surface of the processed products. It was shown that 3, 4-benzpyrene penetrated into the inner part of the fish: especially fish not covered with heavy fish scales, and split fish, in which the contact between the flesh of the fish and the smoke was direct. In the case of the sprat, smoked by the hot or cold processes, 33 to 38 percent of the total 3, 4-benzpyrene contained in the fish penetrated into the flesh; in the case of the bream or split Rutilus, 26 percent of 3, 4-benzpyrene penetrated into the flesh; and for the split Barbel up to 87 percent penetrated into the flesh. In cases of smoked whole bream, Rutilus, Pelecus and Chalcalburnus, which are covered with heavy scales, the 3, 4-benzpyrene content of the flesh was many times less than its content in the same types of fish processed after splitting. The results of the investigation indicated that the content of 3, 4-benzpyrene in smoked fish did not depend solely on the process by which it was smoked, whether cold or hot, or whether the smoke came from openly burned wood or from special smoke generators.

B-7570

Kireeva, I. S.
ATMOSPHERIC POLLUTION WITH 3, 4-BENZPYRENE IN THE VICINITY OF A COAL BRIQUET FACTORY. [O zagryaznenii atmosfernogo vozdukha 3, 4-benzpirenom v raione briketnoi fabriki.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7):126-128, July 1965. 9 refs.
CFSTI: TT 66-51033/3

An investigation was conducted of a large briquet factory which uses 11 percent coal pitch for the binding of coal fines, so that the 3, 4-benzpyrene content in the coal briquets reaches 0.14 percent. The process of briqueting includes crushing bituminous coal and pitch, mixing them in a certain ratio, and molding the briquets. Determinations were made of the amounts of 3, 4-benzpyrene in the gases discharged by the press shop, in the atmosphere, and in the dust falling at distances of 200 to 1000 m from the factory. Tarry substances were extracted with pure nonfluorescent benzene and fractionated on a chromatographic column with an activated aluminum mixture. Identification of 3, 4-benzpyrene was accomplished by comparing the fluorescence spectra of the individual fractions frozen in liquid nitrogen against the fluorescence spectrum of a standard 3, 4-benzpyrene. The quantity of the latter was determined photoelectrically. Thus, 3, 4-benzpyrene was found in all samples within the radius of 1 km from the factory, the concentration decreasing regularly with increasing distance from the factory. However, concentrations exceeded the control determinations made on the windward side (0.14--0.30 microgram/100 m^3) even at a distance of 1000 m. The results indicate the need to eliminate coal pitch from the technological process and introduce a new briqueting technology using noncarcinogenic grades of petroleum bitumens as the binder.

B-7585

Kellerwessel, Hans
PRACTICAL EXAMPLES OF ULTRAFINE GRINDING IN THE RAW MATERIAL INDUSTRY. STAUB (English Translation), 27(1):46-48, Jan. 1967. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

Continuously operating tubular ball mills are widely used in the raw material industry for very fine milling. The use of these mills and their field of application are explained by some practical examples. Tubular ball mills with two milling tubes arranged above one another are particularly suitable for adaptation to different conditions. (Author's summary)

B-7853

Plust, Heinz G.
FUEL CELLS: PRINCIPLE OF OPERATION, DESIGN AND PRESENT STATE OF THE ART IN FUEL CELL DEVELOPMENT. [Die Brennstoffzellen: Wirkungsweise, Aufbau und Heutiger Entwicklungsstand der Brennstoffzellen.] Neue Zuricher Zeitung, Technol. Suppl. No. 133, Jan. 12, 1966. 4 refs. Translated from German.
CFSTI, DDC: AD 805336

The fuel cell has achieved great progress in recent years. With the aid of this cell it is possible to convert the chemical energy of fuels directly into electrical energy without any limitation due to the so-called Carnot's degree of effectiveness. The present-day state of the art in fuel cell development is marked by the fact that for greater output (above 1 kW) only those fuel cells that operate on hydrogen as fuel and oxygen as oxydizer are sufficiently far developed in order to test them for practical applications. DC voltages of 700 Volts could be achieved by placing such cells in series; however, it is customary to use batteries below 100 Volts. Performance weights of 10. . . 45 kg/kW and performance volumes of 10. . . 40 dm^3/kW are usually stated for these batteries. These data are reduced by the necessary accessories (control system, heat exchange, water removal, converter, etc.) which must first be developed and newly designed in many cases. It is possible to purchase a 1 kW fuel cell for about 10,500 dollars.

B-8147

Pakhotina, N. S.
SANITARY-HYGIENIC EVALUATION OF INDUSTRIAL EMISSIONS BY A ZINC-LEAD COMBINE. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 93-97, May 1960. 6 refs.
CFSTI: TT 60-21475

The degree of atmospheric air pollution and vegetation pollution by the discharges of lead-zinc combine and the distance over which such pollution extended were investigated. It should be mentioned at this point that according to N 101-54 the sanitary-clearance zone around lead-zinc combines must be 1000 m wide. The lead-zinc combine under investigation had the following departments: a) premetallurgical production of lead from enriched ore concentrates; b) production of zinc by the continuous and intermittent processes of pyrite cinders leaching and the utilization of tailings, such as zinc cakes, sands, etc.; c) production of sulfuric acid by the contact method from SO_2 formed in the process of calcining the zinc concentrates. Samples were collected by the sedimentation and aspiration methods. Determinations were made for lead, arsenic and SO_2. Soil samples were analyzed for pH, moisture content, H_2SO_4, and total lead and arsenic; plant samples were analyzed for lead, arsenic and H_2SO_4. Samples were taken 150 m to 5000 m away from the emission source. For control purposes, samples were also taken 16 km away. Industrial discharges of the lead-zinc combine heavily polluted the atmospheric air with SO_2, lead, and arsenic at all distances from the combine at which samples were taken. The degree of soil and plant pollution with lead and arsenic over the three years of the combine's operation considerably exceeded the content of lead and arsenic in the soil and on plants of the control region. Under such pollution conditions the prescribed sanitary clearance zone of 1000 m proved inadequate as a sanitary protection measure.

B-8165

Nedogibchenko, M. K.
PRESENT DAY CONDITIONS OF ATMOSPHERIC AIR POLLUTION BY AUTOMOBILE EXHAUST GASES IN CITIES AND PROBLEMS OF ITS CONTROL. Gigiena i Sanit., 23(8):6-9, 1958. 7 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 195-199, May 1960.
CFSTI: TT 60-21475

Air quality measurements in Russian cities indicated that carbon monoxide was the most important automotive exhaust pollutant. In Moscow, maximum concentrations of carbon monoxide reached 100 - 200 mg/m^3; in Leningrad 145 - 164 mg/m^3; in Saratov 20 - 60 mg/m^3; in Perm 40 - 60 mg/m^3; and in Ivanova 18 - 88 mg/m^3. In Sverdlovsk the lead content in the exhaust gases ranged between 0.069 - 3.70 mg/m^3, depending upon the make of the motor vehicle. Investigations in Moscow in connection with the utilization of ethylated gasoline by the passenger auto transport revealed only from 0.001 to 0.003 mg/m^3 of lead in the street air. Investigations disclosed in auto transport exhaust gases the presence of a polycyclic hydrocarbon, 3,4-benzpyrene, generated at the rate of 0.75 mg/min. According to most recent reports auto transport exhaust gases were polluting atmospheric air also with nitrogen oxides; the more incomplete was the gas combustion the greater was the quantity of formed carbon monoxide and less of nitrogen oxides were emitted into the air; vice versa, the more complete the gas combustion the less CO was formed and the more nitrogen oxides were discharged into the air. Next in importance to air pollution with carbon monoxide is air pollution with soot discharged in large quantities with automobile exhaust gases. The cause of this type of atmospheric air pollution lies in the unsatisfactory technical construction and mechanical and functional adjustment of the engines. The reduction of city air pollution caused by auto-transport exhaust gases should be carried out along the following basic lines: Improvement in the design of automobile motors and carburetors with a view to increasing degree of combustion and of gasoline utilization. Development of methods to render harmless exhaust gases emitted by auto-transport engines, preferably by oxidizing them to smaller non-harmful or less harmful molecules.

B-8200

Gurinov, B. P.
THE EFFECT OF COMBUSTION METHOD AND OF FUEL TYPE ON THE CONTENT OF 3,4-BENZPYRENE IN SMOKE GLASS. Gigiena i Sanit., 23(12):6-9, 1958. 5 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases. No. 4, p. 260-264, Aug. 1960.
CFSTI: TT 60-21913

A study was made to determine the effect of different methods of fuel burning on the content of 3,4-benzpyrene in smoke gases. Methods of burning hard fuel differ in different plants; the pulverized and layer bed methods are examples of fuel burning methods most commonly in practice. Both methods of fuel burning were investigated. Dust samples were collected from boiler room smoke flues by an appropriate aspiration method. Two of the boilers burned coal from the vicinity of Moscow, one burned anthracite, and one burned peat. Analogous investigations in boiler rooms using oil as fuel showed that the process of oil burning liberated the greatest amount of carcinogenic substances. The method of layer or bed burning in non-mechanized furnaces produced considerably greater quantities of 3,4-benzpyrene than in mechanized furnaces;

chamber burning of powdered fuel did not produce any carcinogenic substances in smoke discharges. It is recommended that boiler rooms using the bed or layer coal burning method should be equipped with mechanized furnaces; boiler rooms with non-mechanized furnaces should be replaced by central regional boiler rooms and heating centers.

B-8255

Fauth, Ulrich and Walter Schule
GASEOUS AND SOLID EMISSIONS FROM OIL-FIRED STOVES. STAUB (English translation), 27(6):1-11, June 1967. 10 refs.
CFSTI: TT 67-51408/6

Emission from oil-fired furnaces provided with vaporization burners, or atomizers was investigated. The emission of sulfur dioxide, sulfur trioxide, carbon monoxide, and solids (soot and ash) from furnaces of small and medium capacity was investigated. Three oil-fired stoves with vaporization burners, two with atomizers, and a steel heating boiler with a fire-brick combustion chamber were tested. Two commercial extra-light fuel oils were used. When used within its design load range with corresponding drafts, the vaporization burner has a sufficiently low soot emission. Comparatively large soot formation is possible when the oil viscosity is varied, and at extreme draft. Soot formation in atomizers is determined by their suitability for the respective boilers and their setting. This applies both to the installation of the plant and to their inspection, necessary at certain intervals. CO emission in oil heaters is closely related to soot formation. When soot emission is sufficiently small, CO formation is insignificant as regards air pollution. The sulfur contained in the fuel oil is emitted in the flue gas in the form of sulfur dioxide (70 to 80 percent) and sulfur trioxide (1 to 3 percent). The remaining sulfur is adsorbed to the soot as SO_2 or SO_3. Whether, and to what extent SO_3 reaches the atmosphere in the flue gases depends mainly upon the temperatures in the furnace and the flue-gas duct (furnace pipe, stack).

B-8373

Baum, Fritz and Wolfgang Steinbach
WASTE INCINERATION IN SMALL UNITS. STAUB (English translation), 27(7):23-25, July 1967. 10 refs.
CFSTI: TT 67-51408/7

The incinerator investigated has a triple jacket combustion chamber, and is heated up and charged with dry paper waste. The CO and CO_2 concentration was recorded by infrared gas analyzers. During charging, CO concentration rose rapidly to 0.4 - 0.6 vol.-%, then dropped gradually. CO_2 concentration rose rapidly to 1.0 - 1.5 vol.-%, then dropped slowly. The CO and CO_2 concentrations were as a rule much lower than with medium units. Measurements to determine the emission of solids were performed with a Strohlein instrument at the chimney end. The results yielded a solid concentration between 300 and 425 mg/m^3. Large quantities of hydrocarbons were deposited on the measuring filters apart from solids, which gave an impression of a deceptively high dust emission. The strong hydrocarbon development was confirmed by observations and measurements. For a long time white-grey clouds were emitted from the chimney, causing noxious odors in the vicinity.

B-8374

Strauss, Werner and I. B. Speedie
THE FORMATION OF ACID SMUTS IN OIL FIRED KILNS AND BOILERS. STAUB (English translation), 27(7):25-30, July 1967. 17 refs.
CFSTI: TT 67-51408/7

A simulated flue gas containing sulphur dioxide (0.029 percent), water vapor (6.1 percent), and air (93.8 percent) was passed over different flame carbons which have been deposited on the walls of a 3 inch diameter vertical glass tube at simulated chimney temperatures (110°C to 190°C). The total sulphur in the carbon deposit was determined and indicated the following. If the tube walls were of glass then the total sulphur fell from 0.84 percent at 110°C to 0.45 percent at 190°C. If a trace of sulphur trioxide (9 ppm) was added, then sulphur was found to be 1.16 percent at 150°C and 0.90 percent at 190°C. If traces of iron oxide were present, the sulphur content increased from 0.87 percent at 150°C to 1.5 percent at 190°C. These trends indicate that traces of iron oxides tend to favor higher sulphur adsorption, particularly at the higher temperatures.

B-8768

Popov, L. A. and V. D. Yablochkin
CHARACTERISTICS OF GASES RELEASED BY POLYVINYL CHLORIDE FILM. [Sanitarno-khimicheskaya kharakteristika produktov gazovydeleniya polimernoi plenki na osnove polivinikhlorida.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9): 114-117, July-Sept. 1967. 6 refs.
CFSTI: TT 67-51409/3

The gases released by the polyvinyl chloride film were studied in 3-5-liter flasks with ground-glass stoppers. The flasks with the film samples were placed in an UR-106-type oven at 100±2°. The gases released by the polymer material under ordinary operating conditions, i.e., at 20 - 40° were measured. The infrared spectra of polyvinyl chloride films in the region from 3800 to 800 cm^{-1} were measured with a Zeiss UR-10 spectrometer, using a sodium chloride prism. Studies of gases released by V-118 wrapping film based on polyvinyl chloride showed that their concentrations at 20°, 40°, and 100° exceeded the maximum permissible concentration for working premises. Studies of the infrared spectra revealed that the degradation of the polymer at 100° was accompanied by splitting of the molecules of hydrogen chloride and by oxidation processes. Partial depolymerization was indicated by the presence of considerable concentrations of the monomer in the gaseous phase. V-118 wrapping film may be used in small enclosed premises at a saturation of 1 m^2 per m^3, provided that there is adequate ventilation and that permission of the sanitary authorities is obtained.

B-8770

Sokolovskii, M. S., E. M. Pinchuk, and K. N. Pravoverov
THE SANITARY CONDITION OF THE AIR AND MICROCLIMATE IN GAS-BURNING KITCHENS. [Gigienicheskaya otsenka vozdushnoi sredy i mikroklimata gazifitsirovannykh kukhon'.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):171-176, July-Sept. 1967.
CFSTI: TT 67-51409/3

The accumulation of carbon monoxide in the gas-supplied apartments is mainly due to unsatisfactory burning of the gas in the gas-stove burners. The author suggests the permissible contents of carbon monoxide in the combustion products to amount to 0.005 percent at an efficiency coefficient of 70 - 75 percent and a heat production coefficient within 700 kcal/hr. A considerable improvement of the microclimate of the gas-supplied apartments may be attained by the use of flameless burners. (Authors' summary)

B-8777

Jaskulla, N., K. Wettig, and E. Ritter
3,4-BENZPYRENE IN THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES, ESPECIALLY TWO-STROKE ENGINES. [3,4-Benzpiren v vykhlopnykh gazakh dvigatelei vnutrennogo sgoraniya (osobenno dvukhtaktnykh.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):254-260, July-Sept. 1967. 6 refs.
CFSTI: TT 67-51409/3

A test stand was used to test the exhaust gases from a commercially produced 3-cylinder 2-stroke AWE/312 engine (working volume of the cylinder, 991 cm^3). The gas issuing from the exhaust pipe proceeds to the sampling apparatus, and the samples are then tested for 3,4-benzpyrene by means of a filter. In addition, the exhaust gas laboratory tests for other (potentially) harmful components, by means of various instruments. After numerous preliminary experiments, glass fiber paper was used as the filter material. The 3,4-benzpyrene in the solid component of the exhaust gases was detected by thin-layer chromatography. The content of 3,4-benzpyrene in exhaust gases was also determined at plants situated in the neighborhood of heavy urban transport. Tests of the liberation of toxic substances from various fuel components included measurements of the discharge of 3,4-benzpyrene. The maximum absolute discharge of 3,4-benzpyrene (μg/hr) was clearly found to occur under a light load. The highest relative concentration of 3,4-benzpyrene ($\mu g/m^3$) in the exhaust gases occurred when the engine was running idly. The level of 3,4-benzpyrene was decreased at higher exhaust-gas temperatures.

B-8779

Litvinov, V. I., M. I. Belyaev, and I. G. Meshcheryakov
A COMPARATIVE HYGIENIC ASSESSMENT OF THE USE OF ELECTRICITY AND GAS IN PUBLIC CATERING ESTABLISHMENTS. [Sravnitel'naya gigienicheskaya otsenka elektrifitsirovannykh i gazifitsirovannykh predpriyatii obshchestvennogo pitaniya.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9): 269-271, July-Sept. 1967. 1 ref.
CFSTI: TT 67-51409/3

Repeated tests of the air in public catering establishments showed that carbon monoxide concentrations of 0.0015 - 0.0018 mg/l were consistently detected at a level of 1.5 - 2m above the hot surface of gas appliances (the maximum concentration allowed by Government Standard 5548-50 is 0.002 mg/l.) In similar air samples taken in a kitchen with electrical appliances the content of carbon monoxide was nil or practically negligible. From the point of view of the health of the kitchen staff, electric appliances are much more satisfactory than gas equipment. Electric appliances comply with the hygienic standards for the kitchens of public catering establishments, including a normal liberation of heat in the "working zone" and the absence of products of incomplete combustion of the gas. In view of the increasing production of electric power in the U.S.S.R., gas should be replaced by electric power at public catering establishments. As a number of such establishments will still be obliged to use gas, work should be done on improving the design of gas appliances. Manufacturers of appliances for commercial and public catering establishments should increase their output of gas appliances with infrared burners. Architects and the building authorities should pay serious attention to the ventilation of gas-fuelled public catering establishments, so that any health hazards generated by the gas appliances should be removed as quickly as possible.

B-9103

Kalishevskii, L. L. and B. G. Ganchev
A STUDY OF THE CYCLONE PROCESS WHEN BURNING SOLID FUEL. Thermal Eng. (English translation of: Teploenergetika), No. 2, p. 70-74, Feb. 1967. 4 refs.

Studies carried out on the MVTU-MoTsKTI cyclone furnace test rig showed that when burning low-ash Donets gas and long flame coals in an axial cyclone chamber losses due to unburnt carbon for the whole plant, in the best conditions, comprised 2 - 3 percent (there were no losses due to unburnt gases in all cases), when burning the same fuel supplied tangentially losses due to unburnt carbon did not exceed 1 percent. The determination of the combustion efficiency of fuel in the cyclone chamber (over the inner edge of the throat) revealed the same level of combustion efficiency with satisfactory conditions, in both types of chamber. However, the pattern of heat losses differed. The main part of the losses at the outlet of the axial cyclone were due to unburnt carbon (losses due to unburnt gases did not exceed 2 percent) and at the outlet of the tangential cyclone due to unburnt gases (losses due to unburnt carbon were less than 2 percent). The gases in the furnace volume after the cyclone burn better than the non-gasified fuel. Hence the difference in efficiency of the whole plant.

B-9275

Bohne, Helmut
IMMISSION DAMAGE CAUSED BY HOSPITAL WASTE INCINERATION. STAUB (English translation), 27(10):28-31, Oct. 1967. 4 refs.
CFSTI: TT 67-51408/10

The strong decolorization and whitening of plants observed in two gardening nurseries were caused by hydrogen chloride. In both cases the sources of emission were refuse incineration plants of hospitals in which chlorine compounds in the refuse, consisting 80 - 90 percent of paper and packaging material, were decomposed during short periods at a temperature of 800 - 1000°C. Erection of chlorine washing plants appears, therefore, to be necessary. (Author's summary)

C-3775

Gräfe, Kurt and Joachim Hagen
MINIMUM STACK HEIGHTS AND AREA AROUND STACK WITHIN WHICH BUILDING MUST BE CONSIDERED.
STAUB (English translation), 26(9):41-43, Sept. 1966.
7 refs.

In order to calculate the distance from the stack covering the area where buildings have to be considered, a formula is derived from the equation for the distribution of the SO_2 concentration in the surroundings of a source. Thus, a suggestion is made as a basis for discussion with regard to an addition to the "Technische Anleitung Reinhaltung der Luft" (a paper containing rules for minimum stack heights). An example illustrates the possibilities for practical application.

C-4103

Gorkavenko, D. B.
EFFECT OF NATURAL CLIMATIC CONDITIONS ON ATMOSPHERIC AIR POLLUTION NEAR SEASHORE CITIES
Gigiena i Sanit., 28(9):95-96, Sept. 1963. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 226-229, 1966.
CFSTI: TT 66-61429

It is known that some cities located close to the seashore which had no definite sources of atmospheric air pollution had a considerable air pollution fallout amounting to 750 - 900 tons per 1 km^2 annually, and single air pollution concentrations 7 times as great as the specified maximal permissible air pollution concentration. This paradoxical phenomenon can be explained by specific natural local climatic conditions. The topography complex of near seashore cities has a considerable effect on the city's local climatic conditions. Cold air masses descending along the hill slopes produced disturbances in the vertical temperature gradient, as a result of which smoke failed to rise and extended horizontally over the city, creating heavy smogs consisting of gaseous vapor and solid particulate substances. These conditions become considerably aggravated in the presence of temperature inversion. Natural climatic conditions of cities located in close proximity to seashores contributed to the formation of high pollution concentrations even when pollution discharges were relatively low. This fact makes the problem of atmospheric air protection more pressing in cities located in close proximity to seashores. The facts discussed must be taken into consideration by authoritative bodies concerned with the planning and construction of near seashore cities.

C-4152

Gol'm, T. S.
TIME-DEPENDENT VARIATIONS IN TOTAL ATMOSPHERIC OZONE OVER DIXON IS. AND ITS CORRELATION WITH METEOROLOGICAL ELEMENTS. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 13 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 28-37, 1966.
CFSTI: TT 66-62191

Systematic observations of total ozone in the atmosphere of Dixon Island began with the delivery of a spectrophotometer equipped with a quartz optical system. The total ozone determinations were made using direct solar light or full moon lunar light. A brief analysis on total atmospheric ozone was done with the following results: Annual variation in total atmospheric ozone accorded generally with the mean annual variations for high latitudes. An appreciable increase in total atmospheric ozone had been observed during noon hours, although at times, total ozone variations persisted during the day. Correlation of total atmospheric ozone with tropopause height, temperature, and pressure in the upper troposphere and lower stratosphere was most distinct during summer months, and very weak during spring and fall.

C-4154

Kuznetsov, G. I.
OZONE AND GENERAL ATMOSPHERE CIRCULATION. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 57-72, 1966.
CFSTI: TT 66-62191

The following subjects are discussed in this paper: daily ozone fluctuations; circulation index; general realtionships between ozone concentration and atmospheric circulation; speculations concerning the mechanism of connection between atmospheric ozone and circulation; and southern hemisphere characteristics studies. The conclusions reached are not final, since accumulated data have not been evaluated. It is hoped that conclusions reached may suggest future investigation of relationships between atmospheric ozone and weather conditions.

C-4156

Steblova, R. S.
ATMOSPHERIC OZONE TEMPERATURE REGIME ACCORDING TO SPECTROSCOPIC GROUND OBSERVATIONS. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 20 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 86-101, 1966.
CFSTI: TT 66-62191

This report discusses studies aimed at finding the correct answer to the problems related to ozone layer temperature and the connection between factors causing changes in ozonosphere properties, including temperature and vertical distribution changes in relation to lower atmospheric layers and to solar activity. The brief preliminary experimental results presented are basically intended for the description of observation methods.

C-4158

Gushchin, G. P.
REGULARITIES IN HORIZONTAL DISTRIBUTION OF AND SEASONAL CHANGE IN ATMOSPHERIC OZONE. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 15 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 107-122, 1966.
CFSTI: TT 66-62191

This paper analyzes the basic principles of horizontal ozone distribution and its seasonal changes from observed data, and studies basic factors and their interactions which determined the mean and instantaneous horizontal ozone distributions. The mean horizontal distribution of total atmospheric ozone can be defined by two basic factors: solar radiation and turbulent diffusion. The pattern of instantaneous horizontal atmospheric total ozone distribution was associated closely with high-altitude baric fields and, in particular, with jet streams. Naturally, principles which governed latitudinal jet stream distribution can also affect the average pattern of horizontal ozone distribution.

C-4159

Britaev, A. S. and A. P. Kuznetsov
CONNECTION BETWEEN ATMOSPHERIC OZONE AND METEOROLOGICAL CONDITIONS. In: Part 1 - Atmospheric Ozone. Results of U. S. S. R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 11 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 123-126, 1966.
CFSTI: TT 66-62191

Atmospheric ozone and its relation to atmospheric physical processes can be used in investigating basic factors which form weather and govern the sun's effect on our planet. The relationship between ozone and horizontal air advection has been investigated. The paper reviews work undertaken on this subject. It is concluded that vertical currents constitute a basic factor which regulates the amount of atmospheric ozone. This conclusion is compatible with data obtained by other investigators and the material presented leads to the conclusion that the relationship between ozone fluctuations and meteorological conditions can be expressed primarily in terms of horizontal and vertical atmospheric current.

C-4161

Khrgian, A. Kh. and G. I. Kuznetsov
DIURNAL COURSE OF ATMOSPHERIC OZONE. In: Part 1 - Atmospheric Ozone. Results of U. S. S. R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 3 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 132-133, 1966.
CFSTI: TT 66-6219

The magnitudes were determined of diurnal ozone changes from observation data of several IGY observatories. The most reliable and comprehensive data were obtained by the Vigma-di-Valle Observatory, and the less detailed data, although still reliable, were obtained by the Reikjavik Observatory. The frequently occurring nonperiodic diurnal ozone concentration changes should be attributed primarily to atmospheric movements, and possibly to observation errors. However, calculations of mean values (x) for individual hours during any season enable the investigator to distinguish systematic diurnal ozone content variations.

C-4163

Gushchin, G. P.
CAUSES OF RAPID WINTER TEMPERATURE VARIATIONS IN THE ARCTIC STRATOSPHERE. In: Part 2 - Atmospheric Ozone. Data presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 30 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 143-163, 1966.
CFSTI: TT 66-62191

The observed zonal circulation in the stratosphere was more regular in the Southern Hemisphere than in the Northern Hemisphere. Therefore, intrusions of warm ozone-rich stratospheric air masses into the polar region were unlikely in the Southern Hemisphere during winter, indicating that the Antarctic received ozone from lower latitudes to a lesser degree than did the Arctic, thereby affecting the mean ozone distribution meridionally; less ozone was found over the South Pole than over the North Pole. It should also be noted that in the above-compiled calculations no allowance was made for cloudiness and for ice cover. Generally, the foregoing indicated that the radiative and turbulence processes and, in particular, atmospheric ozone played an important role in the complex phenomenon of stratospheric heating. However, these processes fail to explain the total complexity of the discussed phenomenon; problems of its dynamics and the possibility of solar activity effect on these processes still remain unexplained.

C-4164

Khrgian, A. Kh. and G. I. Kuznetsov
SOME RESULTS OF OZONE OBSERVATIONS MADE 15 FEBRUARY 1961 DURING A TOTAL SOLAR ECLIPSE. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational diseases, No. 13, p. 164-169, 1966.
CFSTI: TT 66-62191

Ozone changes occurring during a solar eclipse throw light on the actual rate of photochemical reactions taking place in the ozone layer and on their stability. Total ozone measurements were conducted on board a search-plane. The point was located along the path of total solar eclipse. The search plane executed 20-minute forward and reverse flights along the total solar eclipse belt on a base of approximately 70 km and at a 300 m height. Observations were made through open illuminators on the port and starboard sides of the plane. A filter-equipped universal GGO (Government Geophysical Observatory) ozonometer was used. The filter band centers were at: I--3120A° and II--3700A°. The instrument was calibrated at the GGO by means of a Dobson spectrophotometer. Ozone content was determined from nomograms computed for the corresponding flight altitudes.

C-4165

Dolgin, I. M. and G. U. Karimova
EFFECT OF CIRCULATION CONDITIONS ON THE DISTRIBUTION OF TOTAL OZONE IN THE ARCTIC. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 3 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 170-177, 1966.
CFSTI: TT 66-62191

The following relationships were established by calculations of total ozone deviations from the mean of different types of synoptic processes over Dixon Island. Greatest deviations in the ozone content (+ 0.026 cm) occurred under cyclonic conditions over the Dixon Island region, resulting from the C-type circulation. Under similar synoptic conditions, induced by W-type circulation, ozone content deviations amounted to a mere + 0.002 cm; deviation in ozone content was intermediate in the case of E-type circulation. Ozone content deviation was small for all circulation types and did not exceed -0.012 cm for the E-type circulation under anticyclonic conditions even in the Dixon Island Region. The conclusions are based on a limited volume of materials for a summer period when synoptic processes in the arctic were less intense. The results must be considered as of preliminary nature and incomplete for the solution of the problem. However, the observations in conjunction with similar observations by others point to the need for continued efforts in this direction.

C-4166

Pogosyan, Kh. P. and A. A. Pavlovskaya
CHARACTERISTICS OF WINTER AND SUMMER AIR CIRCULATION IN THE NORTHERN HEMISPHERE STRATOSPHERE. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 177-185, 1966.
CFSTI: TT 66-62191

The basic reasons for differences in the nature of stratospheric processes during winter and summer are: During winter, between the intermediate and high stratosphere latitude, the horizontal temperature gradient increases with height, the temperature contrast increases, winds become intensified, and in the 50-70 degree region at heights from 25 to 35 km, attain velocities of 40-50 m/sec. Wind velocities above the tropopause decrease during summer becoming easterly with height; at 25 to 35 km in the region (50-70 degree), the winds normally do not exceed 10-15 m/sec. Consequently, horizontal and vertical air circulation intensity in the lower stratosphere increase with height during winter and decrease during summer. Stratospheric processes which occur during winter and summer exhibit an incomparably higher activity than those which occur during summer and fall. It also explains the frequent temperature increases in the stratosphere during winter and at the beginning of spring, which are completely unrelated to the radiative air heating.

C-4167

Karol', I. L.
A COMPARATIVE ANALYSIS OF OBSERVED RLANETARY DISTRIBUTIONS OF OZONE AND CERTAIN RADIOISOTOPES IN THE ATMOSPHERE. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 19 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 185-205, 1966.
CFSTI: TT 66-62191

The relationship between observed meridional distribution of and seasonal changes in total atmospheric ozone and the world-wide distribution of radioactive fallout due to nuclear explosions was noted in 1956. Records of such observations contain no detailed analysis or comparison of existing ozone data with radioactive debris in the atmosphere. The present study represents an attempt to analyze and compare data published on meridional and vertical distributions of mean monthly ozone concentrations in relation to some radioisotopes released by giant nuclear explosions in the troposphere and lower stratosphere of the northern hemisphere. Results of the analysis should be helpful in arriving at some preliminary qualitative conclusions regarding the nature of world-wide ozone and fallout distribution in the atmosphere and on the special characteristics of universal atmospheric movements.

C-4168

Govorushkin, L. A.
RESULTS OF 1962 ATMOSPHERIC OZONE OBSERVATIONS IN OMSK IN JUXTAPOSITION WITH SOME METEOROLOGICAL ELEMENTS. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 205-212, 1966.
CFSTI: TT 66-62191

The study of the relationship of atmospheric ozone to meteorological conditions is discussed. Total ozone is correlated with the following aerological data: Temperature, pressure, and tropopause height. Results are listed in a table. Coefficients of correlation between ozone, and temperature and pressure were determined for altitudes of 6, 8, 12, 14, and 16 km. Calculation results showed that close relationship existed between ozone content and meteorological elements at different altitudes; moreover, the correlation coefficient exhibited a pattern of well-defined changes during the year. The most distinct correlation between ozone and temperature and pressure was observed in the summer and autumn months. Results of calculated correlation coefficients agreed well with data obtained at other stations. The data coincidence reflects the existence of a regular relationship between ozone and meteorological elements.

C-4202

Shafrin, Yu. A.
STATISTICAL CHARACTERISTICS OF THE OZONE LAYER. Translated from Russian. Atmospheric and Oceanic Physics, 2(6):647-655, June 1966. 20 refs.

The basic statistical characteristics of ozone distributions are calculated and the statistical stability of ozone fields and the possibilities of hydrodynamic and synoptic interpretations of ozone observations are discussed. The characteristics covered include: macroscopic autocorrelation functions of total ozone, autocorrelation and cross-correlation functions of the vertical profile of ozone concentration, and potential temperature and time spectra for total ozone. The material seems to prove the possible usefulness of statistical description of ozone fields.

C-4229

Koprov, C. M.
SPECTRA OF TURBULENT PULSATIONS OF THE VERTICAL COMPONENT OF WIND VELOCITY IN ATMOSPHERIC BORDER STRATA UNDER CONDITIONS OF WELL-DEVELOPED CONVECTION. In: Fiz. Atmosfery i Okeana, 1(11):1151-1159, 1965. 10 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 1-14, Sept. 27, 1966.
CFSTI: TT 66-34283

Pulsation spectra of the vertical component of wind velocity have been measured with an acoustic anemometer installed on an aircraft. The spectrum of frequencies measured corresponds to the region of scales up to several kilometers. Relationships are established between height dissipation velocity of turbulent energy, dispersion of pulsations as well as the scale. Results obtained are compared with theoretical data. (Author's summary, modified)

C-4230

Monin, A. S.
THE STRUCTURE OF ATMOSPHERIC TURBULENCE. In: Teoriya Veroyatnostei i ee Primeneniya, 3(3):285-317, 1958. 83 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 15-54, Sept. 27, 1966.
CFSTI: TT 66-34283

This survey presents theoretical information and experimental data about statistical characteristics of turbulent pulsations of wind velocity and temperature in the lower layer of the atmosphere. This information can be useful for the solution of a number of problems of geophysics and technology such as heat and moisture transfer and dynamic interaction of the underlying surface with the atmosphere, resultant transformation of air masses, microclimate of agricultural crops, spreading of impurities in air, scattering of sound and radio waves in atmospheric heterogeneities, flickering of stars, etc. Only steady-state conditions of turbulence in the surface layer of air above a homogenous underlying surface are considered.

C-4246

Krivoruchko, F. D.
DETERMINATION OF AERIAL CONCENTRATION OF DECOMPOSITION AND OXIDATION PRODUCTS OF CERTAIN ORGANOALUMINUM COMPOUNDS (TEA, DEAC, TIBA, AND DIBAC). [Opredelenie produktov razlozheniya i okisleniya v vozdukhe nekotorykh alyuminiiorganicheskikh soedinenii (TEA, DEAKh, TIBA i DIBAKh.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):256-259, Aug. 1966. 3 refs.

In connection with studies of working conditions in the manufacture of triethylaluminum (TEA), diethylaluminum chloride (DEAC), triisobutylaluminum (TIBA), and diisobutylaluminum chloride (DIBAC), it was necessary to determine health hazards in the factory air. Determination in air of substances formed by the decomposition and oxidation of TEA, DEAC, TIBA and DIBAC formed the purpose of the present work. Organoaluminum compounds in sealed glass ampules were used. Investigations were performed in 100 l chambers with a fan for uniform distribution of the decomposition products from organoaluminum compounds. The ampules with samples were broken with a special rod. The breaking of an ampule was followed by the formation of a white aerosol in the chamber (obviously, aluminum oxide) which persisted for 1.5-2.5 hours and then was slowly deposited on the chamber walls. Air samples were taken from the chamber at different time intervals (from 2 min to 3.5 hr). Aluminum oxide aerosols were sampled on an ashless filter paper of "Blue Band" grade in a Plexiglas cartridge. Samples for other toxic substances were taken by means of absorbers, placing filter paper in front of the absorber in order to exclude aluminum oxide. Investigations showed that the processes liberated aluminum oxide aerosol, isobutylene, lower and higher alcohols, aldehydes, carbon monoxide and hydrogen. Moreover, the decomposition and oxidation of DIBAC yielded hydrochloric acid aerosols while the decomposition and oxidation of DEAC yielded ethyl chloride.

C-4366

Mar'in, N. P.
DIFFUSION AND ABSORPTION OF PARTICLES IN A MEDIUM WITH VARIABLE DENSITY. [Diffuziia i pogloshchenie chastits v srede s peremennoi plotnost'yu.] Translated from Russian. Prikl. Matematika i Mekanika 28(1):174-177, Feb. 1964. 1 ref.

A mathematical treatment of the problem of diffusion and absorption of particles in the earth's atmosphere is presented. Atmospheric density is considered to vary according to the exponential law, and the earth is treated as a plane.

C-4462

Gorelik, A. G. and A. A. Chernikov

SOME RESULTS OF RADAR INVESTIGATION OF WIND FIELD STRUCTURE AT HEIGHTS OF 50 TO 700 METERS. [Nekotorye rezul'taty radiolokatsionnogo issledovaniia struktury polia vetra na vysotakh 50-700 m.] Tsentr. Aerolog. Observ. (Moscow) No. 57, p. 3-18, 1964. Translated from Russian. American Meteorological Society, Aug. 1965, 21p. 8 refs.

The results are presented of a radar investigation of wind field structure in the atmospheric surface boundary layer. The observational method and results are described, and the latter are compared with the data of other authors. The effect of the entrainment of particles on the results of radar measurements of wind speed variations and the effect of variations of wind speed and direction on the accuracy of rawin observations are discussed. (Authors' summary modified)

C-4614

Wippermann, F.
DIAGRAMS FOR ESTIMATING THE APPLICABILITY OF CHIMNEY HEIGHTS TO AIR PURIFICATION CONDITIONS. [Diagramme zur Beurteilung der Eignung von Schornsteinhöhen für die Luftreinhaltung.] Technische Hochschule Darmstadt Institut für Meteorologie. 7 refs. Translated from German. Air Force Cambridge Research Laboratories, Office of Aerospace Research, L. G. Hanscom Field, Bedford, Mass., 46p., Sept. 1963.

If the frequency distribution of the wind velocity is considered the most important meteorological parameter in the diffusion theory, diagrams can be drawn up which allow statements on the maximum of the surface concentration of harmful gases which are emitted, and the frequency of its occurrence and position. Also, statements on the frequency of concentrations in excess of the fixed, greatest permissible value and similar matters are possible. (Author's summary, modified)

C-4615

Wippermann, F. and W. Klug
A PROCEDURE FOR DETERMINING MINIMUM CHIMNEY HEIGHTS. [Ein Verfahren zur Bestimmung von Schornsteinmindesthöhen.] Intern. J. Air Water Pollution, Vol. 6, p. 27-43, 1962. 11 refs. Translated from German. Air Force Cambridge Research Laboratories, Office of Aerospace Research, L. G. Hanscom Field, Bedford, Mass., 33p., Sept. 1963.

A procedure is given which makes it possible to determine the minimum height of chimneys such that a given maximum allowable concentration at ground level is not exceeded. The first part of the paper deals with the use of nomograms, while the second gives the theoretical basis of these nomograms; in particular, derivation of the formula used and determination of the meteorological parameters contained in it are given. (Authors' abstract)

C-4810

Georgii, H. -W. and L. Hoffmann
ASSESSING SO_2 ENRICHMENT AS DEPENDENT ON METEOROLOGICAL FACTORS. STAUB (English Translation), 26(12):1-4, Dec. 1966. 3 refs.

Measuring times of SO_2 immission concentration in Hamburg and Gelsenkirchen, for the winter of 1960/61, 1961/62, and 1962/63, were investigated with regard to "SO_2 enrichment." Further, attempts were made to establish relationships between "SO_2 enrichment" and meteorological factors. It has been found that increased SO_2 immission concentrations in Gelsenkirchen and Hamburg most probably occur in the case of inversions occurring at heights not exceeding 1000 m, at ground level velocities below 3 m/s and within a visual distance of 4 km. In contrast to this it is less probable that the occurrence of corresponding sets of meteorological conditions could increase SO_2 immission concentration to the extent defined in the paper. (Authors' summary)

C-4811

Prinz, B. and H. Stratmann
THE STATISTICS OF PROPAGATION CONDITIONS IN THE LIGHT OF CONTINUOUS CONCENTRATION MEASUREMENTS OF GASEOUS AIR POLLUTION. STAUB (English Translation), 26(12):4-12, Dec. 1966. 9 refs.

Different observations show that the spreading of emitted gases may be considered as being due to discrete agglomerations drifting away with wind. A statistical model has thus been formulated which leads to a negative binomial distribution for the frequency distribution of emitted gas concentrations. Specific theoretical formulae derived from the model are in good agreement with frequency distribution obtained empirically. In particular, it has been possible to calculate the frequency distribution of SO_2 concentrations for different measuring places, from negative binomial distribution parameters evaluated empirically at one measuring site near an isolated SO_2 emission source, and also from arithmetic means for SO_2 concentrations at other measuring sites. (Authors' summary)

C-4812

Nester, K.
STATISTICAL FREQUENCY DATA ON MAXIMUM CONCENTRATIONS OF STACK EMISSIONS AS BASED ON SYNOPTIC WEATHER OBSERVATION. STAUB (English Translation), 26(12):13-16, Dec. 1966. 6 refs.

On the basis of hourly meteorological observations and by means of propagation types according to Turner and of diffusion parameters characteristic of these types, maximum concentrations at ground level and their distance from a chimney were calculated for various times. From these concentrations frequency graphs were plotted separately for brick chimneys of the following heights: 60 m, 100 m, and 140 m. It is thus possible to make a comparison with graphs which are obtained when the average values for diffusion parameter given in VDI Regulation 2239 are used in the calculation, and when changes in wind velocities in a given period are only taken into consideration. (Author's summary)

C-5034

Borisov, A. V.
THE SIBERIAN SMOKE HAZE OF 1959. In: Priroda, Vol 5, p. 65-66, May 1961. Translated from Russian. Joint Publications Research Service, Washington, D. C., 3p., June 25, 1962.
CFSTI: 62-25500

The extensive reduction in visibility in mid-July 1959 is reviewed. The source of the reduction in direct solar radiation and the increase in the percentage of scattered radiation was smoke from a forest fire.

C-5120

Laktionov, A. G.
ON THE RELATION OF LIGHT SCATTERING IN THE FREE ATMOSPHERE TO VERTICAL DISTRIBUTION OF AEROSOL PARTICLE CONCENTRATION. Izv. Geophys. Ser. 6, p. 953-957, 1964. 8 refs. (Presented at the Conference on Actinometry, Atmospheric Optics, and Nuclear Meteorology, 1960.)

Results of measurements of the concentration and size distribution of particles in the atmosphere are reported. They were made with a flow-through photoelectric instrument and a KOL-90 nephelometer mounted in an IL-14 aircraft. The flow-through instrument gives the concentration and size distribution of the giant particles in the radius range 2.5 to 10 microns. The KOL-90 nephelometer gives a visible measure (allowing for light scattered by the instrument itself) of the intensity of light scattered through 90 degrees by air which has not been cleansed of aerosols. In order to study the change of particle concentration with height, 100 flights were made at different times of year and over different surfaces during 1957-60. The soundings consisted of measurements of concentrations of particles of different sizes at heights of 100, 200, 300, 500, 750, and 1000 m, and higher at 500 m intervals, up to the height where the concentration of particles larger than F less than 4 microns was less than 0.3 particles/liter. Data are presented for decrease in aerosol concentration with height, variation of turbulent mixing as a function of height, studies of concentration of particles of radius of 0.1 micron with height, percentage dependence of aerosol scattering x 100/(aerosol scattering + molecular scattering) on height and seasonal and surface conditions.

C-5240

Krasnopevtsev, Yu. V.
TRANSPORT OF RADIOACTIVE AEROSOLS IN THE TROPOSPHERE FROM THE NORTHERN TO THE SOUTHERN HEMISPHERE. Meteorol. i Gidrol., Vol. 4, p. 3-8, 1964. 10 refs. Translated from Russian. Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio, 10p., July 9, 1965.

The rate of transition through the equatorial zone of radioactive aerosols formed as a result of nuclear explosions in the Northern Hemisphere is evaluated. Samples of the air were taken on a special filter with the aid of an electric fan, and then there was determined their overall beta-activity. A number of the samples were subjected to gamma-spectral analysis for finding the isotopic composition of the aerosols caught. Over the course of the sampling ship from 43 Lat. North 132 Long. East to the central part of the Indian Ocean (30 Lat. South 70 Long. East) the changes of the total beta-activity only partially followed those noted in the previous years. From a comparison of the dates of the observations of the boundary of the "fresh" products of fission, between the Northern and Southern Hemispheres, it is possible to draw some conclusions as to the speed for their shifting across the equatorial zone. The evaluation of the time of the transition across the equatorial zone can be made also on the basis of some other considerations by using the increase in the observed radioactive products.

C-5247

Nemec, L.
CONTRIBUTION TO EXPERIMENTAL DETERMINATION OF DIFFUSION PARAMETERS OF GASES IN THE ATMOSPHERE. Meteorologicke Zpravy, 16(3-4):66-68, Aug. 31, 1963. 2 refs. Translated from Czech. Joint Publications Research Service, Washington, D. C., 8p., Jan. 16, 1964.
CFSTI: TT 64-21309

Ground-level concentration of gases which come from an elevated source above ground depends on the parameters of the emission of the gas, on the parameters of the circulation of the air and of the turbulence diffusion as well as on the position of the place on the ground in relation to the source. In order to express the relations among these parameters various models of dispersion were established, the best known model of which is the Sutton's equation. In order to acquire a more accurate knowledge of these relations, measuring experiments in the areas of some larger electric power plants which provide a constant source of emission were made. The results of these measurements are compared with the computations made on the basis of diffusion models, as recommended by the recent report of the working group of the Commission for Aerology of the World Meteorological Organization. This contribution also offers a proposal as to how to determine three Sutton's parameters of the flow and dispersion from a surface distribution of concentrated gas in a flat terrain, on the assumption that such distribution can be measured with sufficient accuracy.

C-5271

Wippermann, F. and W. Klug
MINIMUM SMOKE STACK HEIGHTS. THEIR DETERMINATION FROM THE PRINCIPLES OF TURBULENT DIFFUSION IN THE ATMOSPHERE. [Schornsteinmindesthoehen. Ihre Bestimmung aus Gesetzmässigkeiten der turbulenten Diffusion in der Atmosphäre.] Verein Deutscher Ingenieure, Kommission Reinhaltung der Luft, 51p., July 1960. 22 refs. Translated from German. American Meteorological Society, Boston, Mass., 49p., March 1961.
CFSTI: TT 62-33590

The physical laws of atmospheric turbulent diffusion are utilized in determining the minimum smoke stack height required to prevent excessive gas concentrations near the ground. This report allows objective calculation of the minimum stack heights, i.e., it replaces various basically different procedures previously employed. This manual prescribes the same stack heights for emission sources of the size under similar conditions and in addition, the stack heights it prescribes for emission sources of various sizes stand in an objective, physically established relationship to each other.

C-5374

Karol', I. L. and A. Ya. Pressman
THE DISTRIBUTION OF A HEAVILY POLYDISPERSED AEROSOL IN A TURBULENT ATMOSPHERE AT A LONG DISTANCE FROM AN INSTANTANEOUS POINT SOURCE. Fiz. Zh., 2(9):83-91, 1959. 6 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 12p., May 9, 1960.
CFSTI: TT 60-11589

Analysis is presented of qualitative and quantitative relationships of the distribution in the atmosphere, and of the gravitational deposition to the surface of the earth of an aerosol that is heterogeneous with respect to its particle composition and that is at considerable distance from its source. The emission is an instantaneous point source. Formulae for volume and surface concentrations are different depending on whether or not the "weightless" component of polydisperse aerosol is reflected by the earth's surface.

C-5375

Karol', I. L.
ON THE INFLUENCE OF TURBULENT DIFFUSION IN THE DIRECTION OF THE WIND ON THE DISTRIBUTION OF THE CONCENTRATION OF A SUBSTANCE THAT IS BEING DIFFUSED IN THE ATMOSPHERE. Dokl. Akad. Nauk SSSP, 131(6):1283-1286, 1960. 7 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 10p., July 15, 1960.
CFSTI: TT 60-11951

A study of the effect of turbulent diffusion of atmospheric particles in the direction of the wind shows that: (1) where the diffusion coefficient in the vertical (k_2) is constant and a "heavy" substance is considered, diffusion in the direction of the wind is considerable, and, (2) where k_2 is not constant (next to ground) and a "heavy" substance is considered, diffusion in the direction of the wind is relatively slight.

C-5459

Shafrin, Yu. A.
FUNDAMENTALS OF THE STATISTICAL METHOD OF SOLVING THE INVERSE PROBLEM OF OZONE MEASUREMENT. Translated from Russian. Atmospheric and Oceanic Physics, 2(11):710-715, 1966. 12 refs.

A mathematical validation of the statistical method of computing the thermal, conservative, and dynamic characteristics of the atmosphere from data based on the ozone concentrations from 10 North American ground stations is presented. The basic difficulty in interpreting ozonometric data is overcome if the nonperiodic and short periodic disturbances from unknown causes and discharges are eliminated. Satellite ozonometry has the advantage of giving within a few hours a simultaneous indication of the global ozone field. Interpretation of the ozonometric data could provide an aid in the synoptic short-term and mathematical long-term weather forecasting.

C-5479

Goetz, A.
AEROSOL FORMATION IN NATURAL AND POLLUTED AIR. [Aerosolbildung in natürlichen und verunreinigten Luftmassen.] Translated from German. Preprint.

(Presented at the Internationales Immissionsschutz Forum, Essen, Germany, 1966.)

The nature, type, and the effects resulting from modifications by aerosols of reactive gaseous constituents contained in the biosphere are reviewed. Aerosols modify the physical as well as the chemical reaction pattern of the molecular-disperse gaseous phase to a considerable degree in spite of the fact that the total mass of this colloid substance is minimal $(10^{-7} - 10^{-8})$ compared to that of the gases which suspend the colloids. The increase in concentration of aerocolloids becomes obvious through a rapidly increasing visibility restriction due to contrast reduction by light scattering should also be considered. The growth of aerosols demonstrates the presence of reactive emission components by increased haze formation. It also has to be realized that the origin of the haze production is not necessarily tied to the locality of the pollution source because such reactions proceed relatively slowly, especially when different reaction partners originate at different localities or when a high particulate level is already present due to climate conditions. The formation of aerocolloids is by far not restricted to industrial and other man-made pollutions but results also from many processes in nature which go on continuously over the earth's surface in large variety. Consequently the final effect of emissions depends to a large extent on the geographical and climatic conditions and the natural aerosol levels, so that knowledge about their origin and formation rate is necessary to judge the final effect of various emission types over specific population areas. The sources, chemical and physical interactions, and methods for determining the size distribution of aerosols are considered.

C-5626

Solokha, T. F.
EXPERIMENTAL CALCULATION OF THE RECURRENCE OF TEMPERATURE AND WIND VELOCITY COMBINATIONS IN THE LOWER 100-M LAYER OF THE ATMOSPHERE. [Opyt rascheta povtoryayemosti kompleksa temperatury i skorosti vetra v nizhnem 100-metrovom sloye atmosfery.] Tr. Nauch.-Issled. Inst. Aeroklimatologii, No. 37, p. 62-82, 1966. 15 refs. Translated from Russian. National Aeronautics and Space Administration, Washington, D. C., 24p., 1967.

A method is developed for approximate computation of the frequency of occurrence of a combination of temperature and wind velocity at heights of 50 to 100 m on the basis of surface data. This was accomplished by using data from a 300-m mast at Obninsk. These data made it possible to check the basic formulas, and for direct checking of factual data on the computed frequency of occurrence of a combination of temperature and wind velocity at a height of 100 m. Observations of air temperature and wind velocity at heights of 8, 48.6, and 96.8 m for eight times of observation were used. The probability of occurrence of a combination of temperature and wind velocity at a height of 100 m, obtained by computations, is close to the observed values; the differences between them for the most part do not exceed 10-12 percent. The proposed method, therefore, can be used for approximate computations in the solution of some practical problems.

C-5660

Barteneva, O. D. and E. A. Polyakova
A STUDY OF ATTENUATION AND SCATTERING OF LIGHT IN A NATURAL FOG DUE TO ITS MICROPHYSICAL PROPERTIES. Atmospheric and Oceanic Physics (English Translation), 1(2):114-121, Feb. 1965. 31 refs.

The correlation dependence between transparency and water contents in fog is obtained from data of simultaneous optical and microphysical measurements. The possibility of calculations of fog microstructure parameters using these two integral characteristics is shown. Scattering indicatrices for fogs and thick hazes are obtained. The classification of indicatrix forms is connected with fog microphysical properties and with the classification proposed earlier for all values of the transparency.

C-5683

Dmitriev, M. T.
SOME PHYSICAL AND CHEMICAL PROCESSES IN AIR CAUSED BY IONIZING RADIATION. Atmospheric and Oceanic Physics (English Translation), 1(3):179-184, March 1965. 17 refs.

A study was made of the physical and chemical processes which are of geophysical interest. In order to simplify the presentation, only the data which bear on the components of air are given. Some physical and chemical process in air such as ionization, molecule dissociation, production of ozone, nitric oxides and carbon dioxide caused by ionizing radiation and in particular by nuclear processes, are analyzed. The data obtained can be used to evaluate the efficiency of different ionizing radiations in the atmosphere.

C-5687

Dunskii, V. F. and S. A. Evseeva
FLUCTUATIONS OF AEROSOL DEPOSITS. Atmospheric and Oceanic Physics (English Translation), 1(5):293-297, May 1965. 3 refs.

Fluctuations of aerosol deposits from the atmospheric surface layer are considered. A long strip of white paper impregnated with a 10 percent solution of iron vitriol and water was fastened to the ground. The aerosol used was a 0.5 percent solution of potassium ferro cyanite salt and water. The distribution of the fluctuations in the density of deposition of the aerosol is determined by a log-normal law. The parameters affecting this distribution are determined for typical conditions.

C-5699

Gedeonov, L. I., V. N. Dmitriev, B. A. Nelepo, A. V. Stepanov, and G. V. Yakovleva
ATMOSPHERIC RADIOACTIVITY ABOVE THE ATLANTIC OCEAN DURING MAY-JULY 1964. Soviet J. At. Energy (English Translation), 19(5):1452-1453, Nov. 1965.

During the 15th voyage of the "Mikhael Lomonosov," atmospheric radioactivity and fallout were studied. Samples of radioactive aerosols were collected by filtering air through an FPP-15 filter. Radioactive fallout was collected in a flanged pot with sticky bottom. A scintillation gamma-spectrometer with an AI-100 analyzer was used for sample analysis. Data on the atmospheric content of aerosols of artificially radioactive materials and their rate of fallout (in terms of total activity) are tabulated, and the results of gamma-analysis are shown. The Sr-90 concentration in the atmosphere was determined by radiochemical methods. For this purpose, samples collected in the Southern Hemisphere (south of 30 degrees S) were combined and analyzed together. The same treatment was given to samples collected in the Northern Hemisphere (north of 8 degrees N) and in the equatorial region (8 degrees N to 8 degrees S). The results of the atmospheric sample studies are also tabulated. A comparison of the results given in this paper with data obtained on the 12 voyages of the "Mikhail Lomonosov" (at the end of 1962) showed the specific activity of aerosols in the surface layer of the atmosphere and the fallout rate were, in the spring of 1964, more than an order of magnitude lower than at the end of 1962 because of the ban on atmospheric nuclear testing. The radioactive aerosol concentration was practically independent of latitude in the range 5 degrees N to 33 degrees N. This is explained by the fact that the data obtained were typical of the northeast trades zone where the lower layers of the atmosphere are intensely mixed in the meridional direction. In addition, there is no direct correlation between radioactive aerosol concentration and fallout rate on the one hand, and between radioactive aerosol concentration and the mean daily values of atmospheric temperature and pressure, on the other. The high radioactive fallout rate in the equatorial region is explained by intense precipitation in the form of rain which washed out the radioactive aerosols in the lower layers of the atmosphere. Concentration values in the equatorial region and in the Southern Hemisphere were much lower than in the Northern Hemisphere.

C-5727

Kampaniets, A. I.
AEROSOL LIGHT SCATTERING INDICATRICES IN THE FREE ATMOSPHERE AT HEIGHTS OF THE ORDER OF 10 KM. Atmospheric and Oceanic Physics (English Translation), 1(3):197-199, March 1965. 8 refs.

The intensity of the daytime sky background was studied at heights similar to 10 km near Moscow in the spring of 1953, using airborne soundings. The measuring apparatus consisted of an optical unit with an adjustable field of view of 5', 10', 20', and 40', which was adjusted beforehand and not changed during flight. The energy receptor was a photomultiplier with an antimony-cesium cathode. The observations were made on two almucantars at zenith distances z_h is equal to 45 and 60 degrees, on azimuths 15, 20, 25, 30, 40, 50, 70, 90, 135, and 180 degrees from the solar vertical. The energy fluxes from about 40 points on the sky during a single flight were found. Six flights in all were made on clear cloudless days. A similar program of groundbased measurements was made on April 3. From the absolute scattering indicatrices, the Rayleigh indicatrices were obtained for the concrete conditions of the experiment with allowance only for first order scattering. In this way the absolute aerosol scattering indicatrices at heights similar to 10 km were obtained. Large daily variations in the aerosol component of the atmosphere lead to considerable changes in the overall sky brightness. The measurements have shown that observations of the sky brightness at great heights give very interesting information on the scattering properties of the finest fraction of the atmospheric aerosols, which are undetected by other methods of studying the physical properties of the free atmosphere.

C-5730

Laikhtman (Leichtmann), D. L., F. A. Gisina, and N. I. Kramer
TAKING THE SPECIAL FEATURES OF ATMOSPHERIC TURBULENCE INTO ACCOUNT WHEN CALCULATING THE POWER AND HEIGHT OF SMOKESTACKS OF INDUSTRIAL PLANTS. Atmospheric and Oceanic Physics (English Translation), 1(11):705-707, Nov. 1965. 6 refs.

The calculation of the permissible smokestack height H should be based on an assessment of the probability of the realization of various meteorological situations. Maximum ground concentration (9M) for fixed external conditions is calculated according to well-known formulas (taking small-scale turbulence into account), while the repeatability of various values of q_m is found on the basis of statistical data concerning a set of values of meteorological conditions (taking large vortices into account). The parameters of the plant being designed should be chosen in such a way that the maximum ground concentration in the direction of greatest repeatability of the wind will, with a certain probability, not exceed the maximum permissible. A mathematical solution to this problem is the main purpose of this article. An equation is derived which for a given probability that the maximum concentration will not exceed the maximum permissible, any of the desired parameters of the smokestacks of an industrial plant can be determined.

C-5734

Malkova, V. S.
SCATTERING OF LIGHT BY PARTICLES OF HAZE. Atmospheric and Oceanic Physics (English Translation), 1(1):63-66, Jan. 1965. 3 refs.

A theoretical calculation of scattering matrices is performed for particles with a parameter rho is equal to 2pia/lambda less than 1 (a is the particle's radius, lambda is the wave length of the incident light). By measuring the ration of f_{11} (0°)/ f_{11} (180°), it is possible to estimate the size of particles participating in scattering if there is a reason to suppose that these are droplets of water or spherical particles with the refraction index close to the refraction index of water. The component f_{33} contains information basically obtained from the examination of the component f_{11}, at least in the range of particle sizes being considered. It is therefore possible either to neglect it or to consider it as verifying the results obtained. The value of f_{12}/f_{11} appears to be the least useful, which in this range of rho proves to be stable with respect to a change of particle sizes, as well as of the refraction index. The component f_{34} could serve as a good check on the sizes of particles and on the absorption capacity of their substance. For the particles of the sizes being considered, however, it is too small for following its variations using the result of the experiment. Based on the sizes of particles that were determined by the rest of the components of the matrix, it is possible, by using the component f_{34}, to theoretically estimate the value of the absorption capacity of the particle-substance, utilizing the relationships from our calculations.

C-5754

Rabinovich, Ya. S.
THE DIFFUSION OF A HEAVY CONTAMINANT FROM A POINT SOURCE IN THE ATMOSPHERE. Atmospheric and Oceanic Physics (English Translation), 1[illegible]:534-538, Sept. 1965. 7 refs.

An analytical solution to the problem of the diffusion of a heavy contaminant in a turbulent atmosphere is proposed. The vertical wind profile and the vertical-diffusion coefficient are approximated by power functions of height. Turbulent diffusion of heavy contaminant entering the atmosphere from a stationary point source located at a certain height above the level of the earth was considered. It was assumed, furthermore, that the vertical wind profile and the coefficient of turbulent diffusion in the vertical direction vary with height according to power laws. (Author's abstract)

C-6303

Skobunov, V. V.
DISSIPATION OF ADMIXTURES FROM POINT SOURCES. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR, p. 27-38, 1962. 2 refs.

In view of the complexity of the aerodynamic and diffusional phenomena, this problem was approached by the physical simulation method. The simulation of the processes of the dissipation of admixtures was based on the mathematical analogy between the dissipation of any gas or a solid finely dispersed aerosol on the one hand and a small admixture of ammonia on the other. Aerodynamically, the air current prior to its separation from the upper edge of the pit wall is a boundary turbulent layer, which is known in meteorology as the near-ground layer. A direct-flow ventilation system is distinguished by flow around the leeward wall of the pit without separation. The flow of air masses and the diffusion of admixtures are determined by the aerodynamic parameters which became established before the flow around the pit space, as well as by parameters which are characteristic of the purely direct-flow ventilation system. In the direct-flow ventilation system the fields of ammonia concentrations in any section of the vertical plane have bell-shaped curves gradually widening downwards along the flow direction. The concentration of ammonia declines in the direction of the flow. The determination of the intensity of the dust sources requires a previous knowledge of the depth of the real open pit (quarry) as well as the order of intensity of the dust liberation and the concentration of the dust at a distance of 0.2 scaling factor because the distance of 0.2m has been taken as the characteristic measurement distance for the maximum concentration in the model. From these data it is possible to determine the corresponding scales (geometric, concentration, and intensity of dust liberation). However, the intensity of the source can be evaluated, say, at a distance of 20m from the source once the dust concentrations $c = 0.3 g/m^3$ have been determined by measurements.

C-6331

Karol', I. L.
ON THE HYPOTHESIS OF A QUASI-STATIONARY SURFACE LAYER IN THE THEORY OF THE TURBULENT DIFFUSION OF A HEAVY AEROSOL IN THE BOUNDARY LAYER OF THE ATMOSPHERE. [O gipoteze kvazistatsionarnogo prizmenogo sloya v teorii turbulentvoy diffusii tyazhelogo aerozolya v pogranichnom sloye atmosfery.] Izv. Akad. Nauk SSSR, Ser. Geofiz. No. 5, p. 753-761, 1960. 7 refs. Translated from Russian. Joint Publications Research Service, New York, N. Y., 10p., Oct. 13, 1960.
CFSTI: TT 60-41611

The possibility of applying the hypothesis of a quasi-stationary surface layer to the problem of the turbulent diffusion of a heavy aerosol is discussed. The connection between the approximate solution obtained in this way and the approximate solution found in a previous paper by a semi-empirical theory is presented.

C-7115

Lambert, G.
STUDY OF THE BEHAVIOR OF ARTIFICIAL RADIOACTIVE AEROSOLS. APPLICATIONS TO SOME PROBLEMS OF ATMOSPHERIC CIRCULATION. [Etude du comportement des aerosols radioactifs artificiels. Applications a quelques problemes de circulation atmospherique.] Commissariat a l'Energie Atomique, Centre d'Etudes Nucleaires, Sacley, France, CEA-R-2347, 227p., 1963. 129 refs. Translated from French. Joint Publications Research Service, Washington, D. C., 310p., 1963. (Thesis presented to the faculty of Sciences of the Univ. of Paris for the Degree of Doctorate in Physical Sciences.)

The extraordinary sensitivity of detection methods has made the following possible: to follow the evolution of the concentration in the atmosphere of various artificial radioactive substances; to derive the general laws of their behavior; and thus to use radioactive tracers to perfect knowledge of the general circulation of the atmosphere. The scientific results obtained are applied to the evaluation and prediction of the contamination of the globe by the artificial radioactive nuclides. The numerical results were gathered mainly between 1958 and 1962. The aerosol samples were taken at about 30 stationary sites, and additional samples were taken from boats and balloons. The radioactive deposit on the ground was collected at about 60 stations situated all over the world. Thus nearly 50,000 numerical results have been collected and treated. The circulation of the aerosols may be compared to that of the air masses which they contain. In the upper atmosphere, gravity alone could not account for the observed distributions. The presence of artificial radioactive aerosols in the troposphere, several years after a series of nuclear explosions, despite the intensive cleansing to which it is subjected, indicates that the latter is compensated for by a continual contribution of stratospheric products, through an extremely stable layer constituted by the tropopause. A dependable estimation of the artificial radioactivity deposited on the surface of the earth by means of extrapolation, starting from given stations, is extremely difficult.

C-7310

Fedorov, M. M.
EFFECT OF SMOKE ON CITY LIGHT. Gigiena i Sanit., 23(8):14-18, 1958. 9 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 213-217, March 1960.
CFSTI: TT 60-21188

In 1950 - 1953 a study was made of light conditions of the town of Zaporozh'e by determining factors which affected total light absorption and degree of dispersed light absorption. The studies were made with the aid of photoelectric luxometers equipped with selenium photoelements designed by the U. S. S. R. Academy of Sciences. The luxometers were standardized at the Institute of Physics at the Academy. The stadium "Locomotive" and the physical training grounds of the Pedagogical Institute, located in the old section of the town, constituted the basic centers of observations, where illumination intensity measurements were made systematically at 9, 12, and 4 o'clock. Another observation point of illumination intensity was located on the grounds of the steel plant Zaporozhstal. The control observation point of light intensity was located in village of Kushugum 25 kilometers from the factory grounds. Illumination determinations at these points were made at the same hours of the day. The height of the sun over the horizon, atmospheric clarity, the shape and number of clouds, the presence of snow on the ground, etc., all have an effect on the intensity of natural light striking a horizontal surface. The interaction between the factors mentioned determines the annual course of noon-day illumination intensity. Data shows that the total illumination in the region of villages surrounding the metallurgical plant grounds was lowered by the smoke by 5 - 18 percent as compared with the total illumination of the old section of the town; the total illumination of the latter, in turn, was lowered by 5 percent as compared with the suburban total illumination; therefore, it can be stated that total illumination of the factory villages was 8 - 20 percent below the total illumination of the control observation points. These are only average values. It should be noted that shifts in the wind direction considerably affected total illumination of any particular observation point or locality. In the data presented in this report such effects were taken into consideration.

C-7722

Gasiorowski, Kurt
THE USE OF PROPAGATION FORMULAS TO CALCULATE MINIMUM CHIMNEY HEIGHTS WITH RESPECT TO THEIR ENVIRONMENT. STAUB (English Translation), 27(4):1-5, April 1967. 5 refs.
CFSTI: TT 67-51408/4

A method of taking into account high single objects in the evaluation of minimum chimney heights is developed with the help of extended calculation. The method can also be used for measuring sections to be added to a chimney in the case of buildings or trees reaching the chimney height. On the basis of probability considerations, a simplification is proposed and discussed. (Author's summary)

C-7976L

Bojkov, R. D.
VERTICAL DISTRIBUTION OF OZONE IN THE EARTH'S ATMOSPHERE. Meteorol. i Gidrol., No. 10, p. 3-11, 1965. 20 refs. Translated from Russian. Georgia Inst. of Tech., Atlanta, Engineering Experiment Station, AF 19(628)-5034, G.T.R. 66-22, 20p., Oct. 1966.
CFSTI DDC: AD 812927

The average vertical distribution of ozone along the meridian, and it seasonal variation, based on more detailed data obtained in recent years, are considered. The layer with the highest concentration and the highest percentage content of ozone is on the average 26 km at the equator and 19 km in the polar regions. The most significant variations of concentration and percentage content of ozone are observed in the layers below 25 km. The layer of greatest ozone concentration increases in depth very rapidly from the tropic zone northward, drops down toward the tropopause, and includes the middle as well as the lower stratosphere, especially in winter - spring. The major variation in total ozone content in extratropical latitudes is identified with the variation in the layers below 25 km. These results can be used to check models of stratospheric circulation, the characteristic pattern of which is given in other works, and these largely agree with the views expressed by Kh. P. Pogosyan. The data on ozone variation confirm the presence of meridional transport, directed toward the pole in the middle stratosphere, mainly in winter and spring. Intensive descending motions lead to an abrupt increase of ozone north of the subtropics and in polar latitudes at layers below the concentration maximum. Summer and autumn meridional transport is weaker and sometimes is even directed from pole to equator. At this time, descending motion in the lower stratosphere introduces ozone into the troposphere where it is destroyed more quickly by oxidation processes. Upward motion into the part of middle and upper stratosphere in polar regions conducts ozone to levels above 30-33 km, where it is destroyed photochemically. Thus, even if only qualitatively, confirmation of an approximate model of stratospheric circulation is obtained.

C-8143

Andreyev, P. I.
A COMPARATIVE STUDY OF EXPERIMENTAL AND THEORETICAL ATMOSPHERIC POLLUTION CONCENTRATIONS RESULTING FROM LOW LEVEL EMISSIONS. Gigiena i Sanit., No. 9, p. 17-20, 1952. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 65-69, May 1960.
CFSTI: TT 60-21475

Formulas for the computation of expected concentrations of gases discharged by industrial establishments were derived on the basis of the theory of turbulent diffusion in the atmosphere. One is for the calculation of ground level gas concentration along the axis of a flow coming from a point source (organized) and the other is for the calculation of ground level gas concentrations emanating from a linear source (unorganized). Both formulas are applicable to the determination of theoretical concentrations of gases and highly dispersed dust. A comparison of theoretical concentrations with the experimental data was presented. The formulas given for the dispersion of gases in the atmosphere applicable to cases of either high or low pollution sources will present an adequate picture of the actual process of pollution diffusion in the atmosphere. These formulas may be utilized in dealing with problems arising in planning production and manufacturing plants and in conducting scientific research.

C-8166

Lenshin, V. T.
SULFUROUS ANHYDRIDE IN THE ATMOSPHERIC AIR OF LENINGRAD. Gigiena i Sanit., 23(8):57-59, 1958. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 200-204, May 1960.
CFSTI: TT 60-21475

An effort to establish a connection between concentration of sulfur dioxide in the atmosphere and certain meteorological conditions is reported. The correlation between the SO_2 monthly average concentrations and the monthly average temperatures of the Leningrad air recorded for the period of February 1947 to January 1948 inclusive, showed a higher coefficient of correlation. The high correlation coefficients pointed to the existence of a linear functional relation between concentrations of SO_2 and the temperatures of the air for the entire year. On the basis of the high magnitude of correlation coefficients, the sufficient number of observations, and the constancy of the investigated series, it was possible to derive generalizations expressing the correlation between the mean monthly SO_2 concentrations and the mean monthly temperature of the air for the season when fuel is used and for the season when no fuel is used for heating purposes. It is believed that the stability of the correlation coefficients through the year indicates that SO_2 is constantly present in the atmospheric air of Leningrad. The main causes of the seasonal SO_2 concentration fluctuations in the seasonal changes in the vertical temperature gradient. The rise in SO_2 concentrations during the heating season results not only from the greater amount of burned mineral fuel, but is also the result of unfavorable meteorological conditions. Sulfur dioxide concentrations close to the ground during the cold season of the year is due to the greater air stagnancy in cold weather and to the prevailing radiation inversion, especially in anticyclonic weather; and, in addition, SO_2 is more soluble in the air-suspended moisture at lower temperatures. The greater the amplitude of the course of daily temperature, the greater the temperature gradient amplitude.

C-3197

Bushtueva, K. A.
RATIO OF SULFUR DIOXIDE AND SULFURIC ACID AEROSOL IN ATMOSPHERIC AIR, IN RELATION TO METEOROLOGICAL CONDITIONS. Gigiena i Sanit., No. 11, p. 11-13, 1954. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 193-196, Aug. 1960.
CFSTI: TT 60-21913

The atmosphere of Moscow was analyzed for the presence of sulfuric acid aerosol in an attempt to determine whether or not its presence was in any way related to the oxidation of sulfur dioxide. At the same time an attempt was made to determine what correlation, if any, existed between the concentrations of these two air pollutants and to find the conditions which determined their ratios. One-hundred-ninety-eight 24 hour samples and 50 single concentration samples were collected simultaneously. A study was also made of the relations between the ratio of H_2SO_4 aerosol and SO_2 concentrations and meteorological conditions, such as relative humidity, velocity of wind and the type of weather. The results of the investigation agree with the assumption that sulfuric acid aerosol can accumulate in the atmosphere of a city during calm foggy days.

C-3761

Junge, Chr.
MATHEMATICAL INTERRELATIONSHIPS IN THE SIZE DISTRIBUTION OF ATMOSPHERIC AEROSOLS ABOVE THE CONTINENT. [Gesetzmässigkeiten in der Grössenverteilung atmosphärischer Aerosole über dem Kontinent.] Bericht des Deutschen Wetterdienstes in der U.S. Zone Bad Kissingen, No. 35, p. 261-277, 1951. Translated from German. National Aeronautics and Space Administration, Washington, D. C., 34p., July 1967.

A comprehensive presentation of the complete size distribution of the particles in atmospheric aerosols has not been carried out. The measurements which were previously available only apply to partial ranges of this size distribution. By extending and combining known measuring methods, it is possible to comprehend the entire particle size range for particle diameters of 1 micron or more to a good approximation. The results of measurements show that the size distribution in an aerosol at the edge of a large city can be represented in this range by a simple exponential law. An interpretation for this regularity is sought. It seems probable that the mixing of different types of smoke, with their individual particle size distributions, together with the process of coagulation plays an essential role. On the basis of this result, a survey concerning the synthesis and formation of the overall atmospheric aerosol is given. The distribution law which is discovered provides the key to the solution of many questions concerning the optical properties of haze. This fact is demonstrated by means of two examples. It can be deduced from the results that the distribution law must possess generally applicable characteristics. Along with the other results of these observations, it was possible for the first time to localize the much-disputed maritime component of the aerosol according to its size distribution. Some bioclimatic questions are considered.

C-3764

Huang, Mei-yüan, Chung-hsiang Hung, and Shang-ching Hsiung
A CLOUD-DROPLET SAMPLER FOR CONTINUOUS OPERATION AT GROUND LEVEL. Ch'i Hsiang Hsueh Pao [Acta Meteorol. Sinica] (Peking), 35(2):257-262, May 1965. Translated from Chinese. Emmanuel Coll., Boston, Mass., Research Language Center, AF-19(628)-5073, Emm-67-154, 12p., 1967.
CFSTI, DDC: AD 655367, TT 67-62361

The design and construction of a cloud-droplet sampler for continuous operation at ground level is described. The equipment used previously can only work continuously for two seconds in a single probing, while in this one the duration of continuous sampling may be extended up to two minutes with an adjustable exposure control. Field experiments carried out in the spring of 1964 show that this instrument can be used to scan the fluctuations of parameters characterizing the microstructure of clouds and fog with periods of the order of 0.1 to 10 seconds. A simple assessment of the instrumental error has also been made.

C-3880

Aleksandrova, A. K., N. L. Byzova, and G. B. Mashkova
EXPERIMENTS ON PROPAGATION OF DEPOSITED IMPURITY FROM [THE] POINT [OF ORIGIN] IN THE LOWER LAYER OF [THE] ATMOSPHERE. [Opyty po rasprostraneniyu osazhdayushcheysya primesi op tochechnogo istochika v inzhnem sloye atmosfery.] In: Investigation of the Lower 300-Meter Layer of the Atmosphere (Selected Articles). [Issledovaniye nizhnego 300-metrovogo sloya atmosfery.] AN SSSR. Institut Prikladnoy Geofiziki (Moscow), p. 3-13, 1963. 12 refs. Translated from Russian. Foreign Technology Div., Wright Patterson AFB, Ohio, p. 1-18, May 4, 1967.
CFSTI: TT 67-62854

In calculating the diffusion of either precipitating or weightless contaminants in the boundary layer of the atmosphere, the maximum concentration of contaminants and the distance of this point from the source are of considerable interest. The results of 53 experiments are presented and formulas are derived for these parameters on the basis of 2 systems of calculation, assuming either that the coefficient of vertical turbulent diffusion increases linearly with height, or that it is independent of height. Four types of atmospheric stratification were distinguished (indifferent stratification and 3 degrees of instability). Inversions were not considered. The distance from the source to the area of maximum contaminant density was proportional to the height of the source within each type of stratification and within the altitude range of 25-300 meters (error of ±25 percent). Horizontal diffusion parameters were determined by the type of stratification, while the position and magnitude of the maximum contaminant density, and the length of the contaminated zone were determined by the ratio between the gravitational forces and the turbulence. The first type of calculation yielded better results for the maximum contaminant density during relatively high turbulence, but the second type of calculation was preferable for determining the length of the contaminated zone. At relatively low turbulence, the method of calculation was immaterial.

C-8881

Byzova, N. L.
SOME RESULTS OF MEASUREMENTS OF HORIZONTAL DIFFUSION OF [IMPURITIES] IN [THE] LOWER LAYER OF [THE] ATMOSPHERE. [Nekotoryye rezul'taty izmereniy gorizontal'noy diffuzii primesi v inzhnem sloye atmosfery.] In: Investigation of the Lower 300-Meter Layer of the Atmosphere (Selected Articles). [Issledovaniye nizhnego 300-metrovogo sloya atmosfery.] AN SSSR. Institut Prikladnoy Geofiziki (Moscow), p. 26-34, 1963. 21 refs.

Translated from Russian. Foreign Technology Div., Wright Patterson AFB, Ohio, p. 37-52, May 4, 1967.
CFSTI: TT 67-62854

The results of experiments carried out at altitudes of 25-300 meters are analyzed. During these studies, which provided 226 separate values at distances ranging from 100 meters to 10 km, the atmospheric stratification varied from neutral to highly unstable, and the rate of fall of the contaminant particles due to gravity was less than 0.3 meters/sec, so that diffusion in the vertical direction could be neglected. An extensive analysis showed that the ratio between wind pulsation and wind velocity is essentially independent of height under conditions of indifferent or unstable stratification.

C-9271

Reifferscheid, Hellmut
THE CHARACTERIZATION OF GROUND INVERSIONS WITHIN THE FRAMEWORK OF AIR POLLUTION CONTROL. STAUB (English translation), 27(10):12-18, Oct. 1967. 37 refs.
CFSTI: TT 67-51408/10

The behavior of air pollutants near the ground depends almost exclusively on meteorological and orographic conditions. An attempt has, therefore, been made in the case of so-called "inversion weather conditions" to give a comparable importance to all the meteorological and orographic factors involved. These are then added and give an "inversion factor." Its magnitude should be the measure of the hazards to which the population of the affected zone is exposed. (Author's summary)

D-2554

Kuz'micheva, M. N.
DETERMINATION OF VANADIUM IN AIR. [K voprosu ob opredelenii vanadiya v vozdukhe.] Hygiene and Sanitation (English translation of : Gigiena i Sanit.), 31(2):216-217, Feb. 1966. 3 refs.

The colorimetric reaction of vanadium-V with hydroxamic acid was investigated. The optimum conditions for the assay of total vanadium as aerosol compounds were determined. The effects on the reaction of chromium compounds and nickel compounds possibly present together with vanadium, were determined.

D-3769

Landwehr, Martin
RESULTS OF COMPARATIVE DUST MEASUREMENTS WITH INSTRUMENTS WHOSE SAMPLES ARE EVALUATED EITHER GRAVIMETRICALLY OR NUMERICALLY. STAUB (English translation), 26(9):1-15, Sept. 1966.

This study compares and correlates the instruments used in the countries of the European Economic Community. Comparative dust measurements, carried out on an international level, in which thermal precipitators, konimeters and dust collecting devices with millipore filters were used, as well as instruments with samples evaluated gravimetrically are given. In addition, the tyndalloscope and the aerosol spectrometer by Timbrell were employed. The measurements show that the various instrument designs generally differ from one another, as regards structure and mode of operation, to such an extent that a direct comparison of results is impossible. The disparities between measuring results can frequently be explained by the fact that the evaluation was carried out according to different points of view.

D-3770

Mappes, Rolf
THE SIMULTANEOUS DETERMINATION OF LEAD CONTENT IN THE AIR OF A WORKING PLACE BY FOUR LABORATORIES. STAUB (English Translation), 26(9):15-18, Sept. 1966.

Four laboratories have checked the reliability of their analytical methods by carrying out, at the same time and place, determinations of lead present in the air. After taking into account many possible errors, in spite of the fact that different instruments and analytical methods were used, it has been possible to measure lead dust concentrations below the MAK value (200 microgram Pb/m^3) with deviations up to plus or minus 15 percent (49 out of 51 values). In the case of concentrations below the MAK value the disparities were only slightly higher. This accuracy is quite sufficient for most problems of industrial hygiene. (Author's summary)

D-3771

Simecek, Jaroslav
COMPARATIVE STUDY OF METHODS FOR DETERMINATION OF PARTICLE SIZE. STAUB (English Translation), 26(9):18-26, Sept. 1966. 15 refs.

Eight methods for particle size determination are compared: optical microscopy, sedimentation pipette method, the Leitz sedimentometer, Gallenkamp and Sartorius sedimentation balances, Bahco centrifugal elutriator and Gonell air elutriator. Two types of test dusts (Quartz and fly ash) were used to investigate the accuracy of the methods, comparability of test results, the time consumed, and the problem of the dust quantities required. The different methods have been assessed with regard to their suitability for industrial and hygiene purposes.

D-3772

Buck, Manfred and Hermann Gies
THE MEASUREMENT OF HYDROGEN SULFIDE IN THE ATMOSPHERE (Combined H_2S and SO_2 Measurement). STAUB (English Translation), 26(9):27-33, Sept. 1966. 14 refs.

Modification of a measurement method for hydrogen sulfide in the atmosphere was studied by considering the following parameters: (1) development of a suitable sorption system, (2) desorption and the analytical determination of hydrogen sulfide, (3) limits of detection, and (4) determination of the calibration function. It was ascertained that sorption of hydrogen sulfide, associated with silver sulfide formation, occurs in sorption tubes. Hydrogen sulfide, liberated from it by subsequent treatment with acid, is then determined by the molybdenum blue method. The detection limit lies below the detectable intensity of the hydrogen sulfide smell. Since no sulfur dioxide is absorbed in the hydrogen sulfide sorption tube, sulfur dioxide determination can be carried out simultaneously with hydrogen sulfide using the same air sample.

D-3773

May, Johannes
ODOR THRESHOLDS OF SOLVENTS FOR ASSESSMENT OF SOLVENT ODORS IN THE AIR. STAUB (English Translation), 26(9):34-38, Sept. 1966. 3 refs.

Detection limits of thirty seven (37) solvents were investigated to determine their odor thresholds. Quantitative analyses of vapor concentrations of the solvent mixtures were carried out using gas chromatography. Directives for the limitation of solvent vapor emissions are proposed.

D-3774

Schneider, Willi and Helmut Nagel
SOME REMARKS ON COMPARATIVE DUST PRECIPITATION MEASUREMENTS. STAUB (English Translation), 26(9):39-40, Sept. 1966. 6 refs.

A review of 113 measured values collected during 30-day exposure periods over recent years, at 14 measuring points in the area of Greater Duisburg and its surrounding is presented. It was determined on the basis of more than a hundred measured values that it is an inadmissible generalization to consider conversion factors for dust measuring apparatus, obtained in a measuring field, as factors of general validity. The influence of environment on dust precipitation measurements is so important that conversion of values obtained by different measuring instruments is very doubtful. The measured values are tabulated.

D-3911

Schutz, Alfred
POSSIBILITIES FOR RECORDED DUST MEASUREMENT AND DUST CONTROL. STAUB (English Translation), 26(10):1-8, Oct. 1966. 22 refs.

A survey of different methods for recording dust measurements is given. The following methods are discussed in particular: optical methods; extinction and scattered light measurement; nuclear radiation methods; attenuation of Beta-rays; electrical methods; ion accumulation and contact electricity. The design and mode of operation of the instruments are described. In addition, the relationship between the instrument reading and gravimetric dust concentration is shown, and also the detection sensitivity and the influence of particle size and properties of material. Possibilities of application are discussed. (Author's summary)

D-3912

Coenen, Wilfried
PORTABLE INSTRUMENTS FOR INDUSTRIAL DUST MEASUREMENTS. STAUB (English Translation), 26(10):9-14, Oct. 1966. 11 refs.

Two different principles of dust measurement are known: 1. measurement of particle number concentration, i.e., the collection of small dust samples with subsequent optical counting, and 2. measurement of the mass concentration, i.e., collection of large dust samples with gravimetric evaluation. The basic disadvantages of both methods, as they constitute the starting point for further development and improvement, are discussed. Individual measuring instruments, using the gravimetric method, are described and compared technically, particularly regarding their air flow rate. The high-air flow rate instrument developed by the Dust Research Institute (Staubforschungsinstitut) is also described and its application in industry is explained by examples.

D-3913

Kesting, Arthur Martin
DUST MEASUREMENT IN PLANTS WITH ASBESTOS PROCEEDING MACHINERY. STAUB (English Translation), 26(10):14-16, Oct. 1966.

An inventory of the concentration of dusts associated with the asbestos processing branch of the textile industry is presented. Observations made over long time periods have given basic data for dust concentrations occurring in the individual processing stages. Statistical evaluation of all results of dust measurements shows that there is a continuous decrease in dangerous dust concentration. The object of further investigations is to find out (by comparing cases of illness caused by asbestos with asbestos dust concentrations) at what concentration and exposure time the danger of illness caused by asbestos is negligible. (Author's summary, modified)

D-3914

Walter, Erwin
EVALUATION AND ASSESSMENT OF DUST MEASUREMENTS IN ASBESTOS PLANTS OF THE TEXTILE INDUSTRY. STAUB (English translation), 26(10):16-19, Oct. 1966. 4 refs.

The konimeter measurements carried out over 15 years in asbestos plants of the textile industry, and their classification according to the microphotographic tests are presented. An accurate picture of the situation as regards dust concentration is given. Gravimetric measurements give an average value; they can also be used for an assessment by coefficients. There is a limited relationship between the values measured by filtering instruments and those obtained by konimeter. This is particularly valid when the dust concentration lies below the danger limit. (Author's summary, modified)

D-3915

Kahnwald, Helmut
DUST MEASUREMENTS IN FLOWING GASES. STAUB (English Translation), 26(10):20-22, Oct. 1966. 2 refs.

Values of dust content measured in a production plant vary during operating time. Therefore, to determine the dust emission accurately, dust measurement must be carried out in the shortest possible intervals. When a sufficient number of measured values is available, the probable course of dust emission must be determined by means of probability calculus. The starting point is the theory of random processes, and distinction is made between continuous and discontinuous processes. (Author's summary, modified)

D-4064

Alekseeva, M. V., N. A. Krylova, and V. A. Khrustaleva
SPECTROPHOTOMETRIC DETERMINATION OF BENZENE, ISOPROPYLBENZENE, AND ALPHA-METHYLSTYROL IN THE AIR. Gigiena i Sanit., 28(1):31-36, Jan. 1963. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 1-6, 1966.
CFSTI: TT 66-61429

The following two problems were investigated: (1) determination of small amounts of benzene, isopropylbenzene and alpha-Methylstyrol in the air, and (2) selection of a solvent medium for the collection of samples of the above substances, which might make possible the quantitative determination of the substances. In this connection the spectrophotometric method is based on the determination of the optical density of the investigated substance in solution at a wave length corresponding to its maximum absorption. An essential requisite of this method is that the investigated substance must behave in the selected solution in accordance with Beer's law. Ethanol was finally selected as the solvent in the study here described using spectrophotometer SF-4.

D-4065
Yavorovskaya, S. F.
ABSORPTION OF GASEOUS AND VAPOROUS HARMFUL AIR POLLUTANTS BY MEANS OF A "TURBULENT" LAYER OF HARD SORBENTS. Gigiena i Sanit., 28(1):36-38, Jan. 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 7-8, 1966.
CFSTI: TT 66-61429

An air sample collection procedure according to which the air to be investigated is aspirated through a layer of sorbent in constant agitation, generally referred to as a "turbulent" sorbent, is discussed. Many industrial processes require high rates of gas flow and an almost complete contact with the surfaces of particulate matter; under such conditions, use is made of layers of powdered or granular substances in "turbulent" suspension; such, for instance, in the case of catalytic reactions in drying processes, or in calcination, etc. The "turbulent" condition of the sorbent suspension is further enhanced by creating circulating movements of the air, gas or vapor. The rate of air flow at which the entire mass of the solid sorbent acquires an even up and down movement, here designated as a "turbulent" movement, is usually referred to as the "critical rate". The "turbulent" character of the sorbent suspension layer possesses some advantages over the immovable layer. It is not possible to create a condition of sorbent suspension "turbulence" in tubes. Therefore, the present author developed two types of adsorbers. Both adsorbers consist of cylindrical glass tubes, the upper parts of which are in the form of spherical widenings. In the first adsorber the studied air enters via an inside tube which ends in a funnel-shaped opening, and in the second adsorber the air enters through a perforated glass plate. Both have lateral openings through which the solid sorbent can be introduced. Similar rates of air sample aspiration can be attained with the second type of adsorption tube with more effective agitation of the sorben particles. The method of "turbulent" solid sorbent suspension in conjunction with adsorber tubes here described has been in use in many industrial and sanitary chemical laboratories.

D-4071

Krivoruchko, F. D.
DETERMINATION OF TRIETHOXYSILANE AND OF ETHYLESTER OF ORTHOSILICIC ACID (TETRAETHOXYSILANE) IN THE AIR. Gigiena i Sanit., 28(2):54-56, Feb. 1963. 1 ref. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 40-43, 1966.
CFSTI: TT 66-61429

A rapid and sensitive test was developed for the determination of tri- and tetraethoxysilane in the air of working premises which would not require the use of platinum dishes. Data presented in the literature were used for the determination of silicon in easily hydrolyzed silicon-containing compounds without preliminary oxidation. In order to obtain optimal determination conditions, the first step was hydrolysis of the triethoxysilane and of tetraethoxysilane. Results showed that milligrams and decimilligrams of the two silicon compounds under investigation completely hydrolyzed in 0.05 N. solution of sulfuric acid. The next step was the development of an appropriate procedure for the collection of air samples containing tri- or tetraethoxysilane. Results showed that milligrams and decimilligrams of the two silicon compounds under investigation completely hydrolyzed in 0.05 N. solution of sulfuric acid. The next step was the development of an appropriate procedure for the collection of air samples containing tri- or tetraethoxysilane vapor. Results showed that 0.05 N. solution of sulfuric acid was most suitable for the absorption of either vapor. Precision of the method for the determination of tri- or tetraethoxysilane by the silicon method and standard scale comparison was tested next. The standard scale was prepared with SiO_2 using the above mentioned reducing agent. Results of the check methods established determination errors between the actual amounts resulting from molecular triethoxysilane hydrolysis and the computed amount of silicon. In the case of tri- and tetraethoxysilane the amounts obtained by the determination were 82.2 and 107.8 percent of the total. The average relative determination error was 6.4 percent. Thus, the results convincingly showed that the standard scale method based on SiO_2 could be used in making quantitative determinations of tri- and tetraethoxysilane vapors in the air. The presence of silicon dioxide in the air does not interfere with the determination of the vapors under study. The method has been tested under field and industrial conditions. Thus, a method has been developed for the determination of triethoxysilane and of tetraethoxysilane or ethylester of orthosilicic acid, based on the hydrolysis of the original substances to silicic acid, which is then determined on the basis of the blue silicomolybdic complex. A single determination can be made in 20-30 minutes. The method has been tested under industrial and field conditions.

D-4075

Byknovskaya, M. S.
METHOD FOR THE DETERMINATION OF DITOLYLMETHANE AND THE DIFFERENTIAL DETERMINATION OF DITOLYLMETHANE AND STYROL SIMULTANEOUSLY PRESENT IN THE AIR. Gigiena i Sanit., 28(3):48-52, March 1963. 3 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No 12, p. 59-63, 1966.
CFSTI: TT 66-61429

Use of the new heat carrier - ditolylmethane - for heating manufacturing equipment in industry, and a study of its toxicity, pointed to the necessity of its quantitative determination in air. It is recommended that the following procedure be used for the determination of ditolylmethane in air: Aspirate the air at 12-15 li/hr through two absorbers, each containing a porous glass plate and 2 ml of the nitromixture. Place the connected absorbers into boiling water for 30 min. Cool and take 0.5 ml samples from each absorber; and place into colorimetric cups equipped with ground-to-fit stoppers containing 4.5 ml of distilled water. At the same time, and under similar conditions, prepare a standard scale using a series of test tubes containing 20, 30, 40, and 50 gamma of ditolylmethane. Place 0.3-0.4 gram granulated zinc into each test tube containing the standard solution and the sample; stopper the test tubes and let stand for one hour. Decant the supernatant fluid from the precipitate, and add to each tube 0.5 ml 1.0 percent nitrophenyldiazonium solution, shake, heat on a water bath at 60 degrees and cool· compare color intensity of the sample with the standard scale visually, or photocolorimetrically in 10 mm cups at lambda equals 400 millimicrons. The method sensitivity is 5 gamma in the analyzed solution volume. Benzene, toluol, styrol and other aromatic hydrocarbons interfere with the determination. Ethylene glycol, caprolactam and hexamethylene do not interfere with the reaction. It was established that DTM can be determined by the Yanowsky reaction in alkaline ether-acetone solution. The reaction sensitivity is 10 gamma in the analyzed solution volume. A method was developed for determination of DTM based on reduction of the polynitrocompound DTM and the conjugation of the resulting amine with p-nitrophenyldiazonium. The sensitivity of the method is equal to 5 gamma in the analyzed sample volume. A spectrophotometric method was developed for the separate determination of DTM and styrol simultaneously present in air. The sensitivity of the method is 1 gamma/ml of DTM and of styrol.
styrol.

D-4085

Krotkov, P. A., N. N. Serzhantova, and V. B. Timofeev
A PHOTOELECTROMETRIC METHOD FOR THE DETERMINATION OF LOW 3,4-BENZPYRENE CONCENTRATIONS. Gigiena i Sanit., 28(5):47-49, May 1963. 7 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 116-119, 1966.
CFSTI: TT 66-61429

The report published by P. P. Dikun in 1961 contains a quantitative spectrophotometric method for the determination of low 3,4-benzpyrene concentrations. The sensitivity of the method makes possible the determination of 10^{-8} micron of 3,4-benzpyrene in 1 ml of solution. The quantitative analytical procedure previously recommended by the same author which was based on fluorescent 3,4-benzpyrene spectra at low temperatures and on the use of a photometer as described by F. Weigart in 1934 and V. K. Prokof'ev in 1951. By that procedure, 1, 12-benzperylene was used as the inside standard. The spectra were recorded photographically. The present authors increase the method sensitivity and rapidity by recording spectral intensities photoelectrically.

D-4086

Salyamon, G. S.
COLORIMETRIC METHOD FOR TOTAL ALKYL AMINES DETERMINATION. Gigiena i Sanit., 28(5):50-53, May 1963. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 119-123, 1966.
CFSTI: TT 66-61429

The following reagents and procedures are used in determining amines in the air: 1) Ammonia-free distilled water; remove ammonia and acid by boiling the distilled water for 1-1/2 to 2 hours; keep in a bottle with a stopper through which an absorber tube containing activated charcoal and ascarite is inserted; store so as to prevent contact with air containing ammonia or acid vapor; 2) 0.1 percent solution of O-nitrophenol prepared at 40 - 50 degrees with intermittent stirring; 3) Nessler-Folin solution prepared from potassium iodide, iodine, mercury, and alkali, as described by D. T. You in 1935; 4) Standard 0.1 millimolar (0.1 micro mole/ml) solutions of aliphatic amine and ammonia, prepared by hundredfold dilution of 0.01 M stock solutions, using ammonia-free water; check by titrating 100 ml of the 0.01 M amine solution with a standard 0.1N HCl solution using methyl red as the indicator; 5) Ascarite granular 2-4 mm in diameter. Concentration of amines in the air were computed on the basis of total bases minus ammonia concentration. The value of M/1000, in the case of methylamine is 0.031; for dimethyl- or ethylamine it is 0.045, and for triethylamine, 0.101. The method is accurate to 0.02 micro mole in the colorimetrically analyzed volume; for methylamine and ethylamine it corresponds to about 1 gamma, for di- and tri-ethylamine 2 gamma, and for ammonia 0.4 gamma per sample volume. The method was applied in practice and yielded satisfactory results in determining content of aliphatic amines in the air or working premises and in experimental animal exposure chambers.

D-4090

Salyamon, G. S.
SEPARATION OF ETHYLAMINE TRACES FROM AMMONIA TRACES IN THE AIR. Gigiena i Sanit., 28(6):49-53, June 1963. 12 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 150-155, 1966.
CFSTI: TT 66-61429

The brief simultaneous presence in the air of low ammonia concentrations and of formaldehyde vapor excess elicited an interaction between the two substances which resulted in the formation of hexamethylenetetramine. No interaction occurred between mono-, di-, and triethylamine and formaldehyde gases simultaneously present in the air. On the basis of the above described differential reaction, a procedure and a laboratory apparatus have been developed for the continuous quantitative purification of the examined air and for the separation of ethylamine from ammonia simultaneously present in the air. Direct single or continuous automatic ethylamine determinations in the air can be made by the new analytical procedure and apparatus.

D-4095

Lazareva, T. A.
COLORIMETRIC METHODS FOR THE DETERMINATION OF SULFAMATE IN THE AIR. Gigiena i Sanit., 28(7):45-46, July 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 181-183, 1966.
CFSTI: TT 66-61429

The development of a method for the determination of sulfamate in the air was conducted on the basis of 2 color reactions which characterize the ammonia radical: (a) with Nessler reagent; (b) with phenol and sodium hypochlorite. In the presence of sulfamate, the Nessler reagent produces a complex of a yellowish-brown color. The reaction between phenol and sodium sulfamate in the presence of hypochlorite yields a substance of a blue color. A minimum of 3.35 microns of sulfamate in 5 ml can be determined by this method. In both determination methods the intensity of the color produced is directly proportional to the amount of sulfamate present. In view of the results, it is felt that either of the methods could be used for the determination of sulfamate aerosol concentration in the air under conditions of agricultural application.

D-4099

Poletaev, M. I.
COLORIMETRIC METHOD FOR THE DETERMINATION OF MONOISOPROPYLDIPHENYL IN THE AIR. Gigiena i Sanit., 28(8):40-41, Aug. 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 198-199, 1966.
CFSTI: TT 66-61429

The purpose is to report on attempts to develop a method for the determination of MIPD (Monoisopropyldiphenyl) in the air of working premises. This author used the method based on the colorimetric determination of MIPD by the Yanovskii reaction. Air samples were collected by the aspiration method using the Polezhaev microabsorber which contained 1 ml of a nitro mixture consisting of 10 g of ammonium nitrate in 100 ml of sulfuric acid of 1.82 - 1.84 sp. gr.; the air was aspirated through this medium at the rate of 0.2 - 0.4 li/min. Where the concentration of MIPD is suspected to be high, air samples can be collected by the vacuum method into special containers of 100 - 200 ml capacity. Two ml of the nitro mixture is added to the air sample containing vessel, and let stand for 1 hour periodically washing the walls of the sample container with the nitro mixture. The minimal amount of MIPD determined by the acetone-alkaline medium extraction was 3 microns in colorimetric volume, and by the ether extraction in acid medium, the minimum was 2 microns. In the presence of other aromatic substances, the method is nonspecific.

D-4102

Lindval, R. V. and I. V. Yermakova
ACETYLENE DETERMINATION IN THE AIR BY INFRARED SPECTROSCOPY. Gigiena i Sanit., 28(9):51-54, Sept. 1963. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 216-219, 1966.
CFSTI: TT 66-61429

Acetylene vapor is present in the air of working premises in the production of calcium carbide, in the air of acetylene stations and of plants which use acetylene in their production processes. No maximal permissible concentration of acetylene vapor in the air has as yet been established. A colorimetric method for the determination of acetylene in the air was previously developed. Determination of very low concentrations of acetylene vapor in the air by this method required the collection of large volume air samples, which is time consuming. In addition, different samples are characterized by different color shades which makes precise determination at times difficult, if not impossible. By the method described it is possible to determine minute quantities of acetylene in the air with the aid of infrared microscopy. Data presented show that the colorimetric method yielded somewhat lower results than the spectral method. A method was described for the quantitative determination of low acetylene concentrations in the air; it was developed on the basis of infrared spectrophotometry and is sufficiently sensitive to determine acetylene vapor in the air within the limits of 0.002 - 0.5 percent by volume.

D-4105

Suvorova, S. N., A. M. Vorob'ev, and G. V. Rabovskii
FLUORINE AND HYDROGEN FLUORIDE DETERMINATION IN THE AIR WITH A SOLID SORBENT. Gigiena i Sanit., 28(10):48-50, Oct. 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 241-243, 1966.
CFSTI: TT 66-61429

No simple and adequately sensitive methods have been described for the determination of fluorine and hydrogen fluoride. Therefore, the first step in this investigation was to select a substance which might completely absorb both components. After some preliminary tests the following absorber solution was selected; $Na_2S_2O_3$-7, KI·4, and methyl (p-methylaminophenol sulfate) 0.1 percent by weight. However, successive determinations of the fluorine-ion in this absorber mixture by highly sensitive procedures proved very complicated. For this reason, the present authors decided to use solid absorbers. The first absorber thus tested was silica gel trademarked MSK of granule sizes ranging between 260 and 300 mg, which were impregnated with an aqueous solution of triethanolamine. Best results were obtained with 2 g of the silica gel in a Yavorov or in a U-shaped tube. Fluorine determinations were made colorimetrically by the thorium-thoron method after it had been extracted from the silica gel.

D-4113

Gudzovskii, G. A. and G. G. Scherbakov
A METHOD FOR THE DETERMINATION OF INDUSTRIAL AEROSOLS OF ANTIMONY AND ITS COMPOUNDS. Gigiena i Sanit., 28(12):50-54, Dec. 1963. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 294-297.
CFSTI: TT 66-61429

A method is proposed for the determination of aerosol antimony and its compounds in the air, using a basic dye of the diaminotriphenylmethane series. Filter fabric FPP-15 retained 99.9 percent of the antimony and its compounds contained in the aspirated air sample. The method is precise, simple, comparatively rapid, and can be used in making industrial sanitary determinations in the air of indoor premises by plant laboratories.

D-4149

Kudryavaseva, L. A.
ROCKETBORNE MEASUREMENTS OF VERTICAL ATMOSPHERIC OZONE DISTRIBUTION. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 3-8, 1966.
CFSTI: TT 66-62191

Recorded ozone data were secured by means of a spectrograph with a tracking system mounted on a meteorological rocket; using the method of successive approximations in processing such data the vertical atmospheric ozone distribution was determined up to an altitude of 24 km. Results pointed to a single concentration maximum from 21 to 23 km. In computing ozone concentrations by a specific equation, it was established that the factor which allowed for molecular scattering decreased rapidly with the altitude and could be disregarded above 35 km. The correction factor in the first approximation could be disregarded above 24 km; it did not exceed 2 percent of the ozone content at 13 km. Comparison of rocket-recorded and ground-made measurements indicated that ozone concentration values were of the same order for both.

D-4150

Iozenas, V. A. and A. P. Kuznetsov
PHOTOELECTRIC SPECTROPHOTOMETER FOR ATMOSPHERIC OZONE OBSERVATIONS. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 9-11, 1966.
CFSTI: TT 66-62191

The design of a spectrophotometer, based on a double quartz monochromator for measuring spectral intensity of zenith scattered solar light, is described. This instrument measures variations in the ratio of spectral intensities of solar light scattered from the zenith in a cloudless sky in daytime, 10 minutes before sunrise and 10 minutes after sunset.

D-4151

Britayev, A. S.
CHEMICAL OZONE CONTENT DETERMINATION. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 50 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 11-21, 1966.
CFSTI: TT 66-62191

Direct chemical ozone measurement in the lower atmospheric layers enabled the exact formulation of boundary conditions for vertical ozone distribution and, in particular, refinement of ozone concentration calculations in the upper atmospheric layers based on ground spectrometric data. Furthermore, it was possible to use tropospheric ozone observations in computing vertical wind motion, turbulence, transfer coefficients, to study relationship between ozone, cloudiness, precipitation, etc. Development and construction of the electrochemical ozonometer and chemical ozonometer and chemical ozone radiosonde stimulated and advanced the use of chemical and electrochemical methods.

D-4153

Osherovich, L. and S. F. Radionov
SOME PHOTOELECTRIC OZONOMETER TYPES. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 14 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 50-57, 1966.
CFSTI: TT 66-62191

Results of research in attainment of higher accuracy in ozonometry are presented. Two types of ozonometers, consisting of the following three basic units are proposed: (1) A system for discriminating comparatively narrow spectral intervals in the 3100 - 3300 A° and 4000 - 5000 A° regions in some cases; (2) an electrophotometer; and (3) a device for aiming the ozonometers at an extraterrestrial light source.

D-4157

Gushchin, G. P.
A METHOD FOR COMPUTING TOTAL ATMOSPHERIC OZONE MEASUREMENTS MADE WITH LIGHT FILTER EQUIPPED INSTRUMENTS. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and resolutions, 1961. 20 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 101-106, 1966.
CFSTI: TT 66-62191

The developed method for computing total atmospheric ozone can be used in association with instruments equipped with glass and other filters. The construction of the ozone monogram is based on equations and the method eliminates errors introduced by the aerosols. The proposed ozone nomogram simplifies and facilitates computations.

D-4160

Gushchin, G. P.
TWO IMPORTANT FEATURES OF OZONOMETRIC INSTRUMENTS. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 126-131, 1966.
CFSTI: TT 66-62191

Experiments were conducted for the purpose of explaining the effect of the instrument's solid angle on the measured ozone quantity. The first experiment was to determine the functional relation of the ratio between two filter readings to the solid angle of the universal ozonometer at different solar elevations. The second experiment was to determine the functional relationship of reading ratio I_1/I_2 to altitude above sea level in using instruments having different solid angles at the same solar elevation. The solid angle of an optical ozonometric instrument must be small. Its magnitude should be less than 6 degrees at least in two-dimensional coordinates. A solid angle in excess of 10 degrees introduces an additional error in ozone measurements which is associated with atmospheric light scattering. The larger the solid angle and the lower the solar elevation at the time of the measurements, the greater the error. Ozonometric instruments should be provided with means for compensating errors due to temperature. Temperature errors in filter-equipped ozonometers reflected the dependence of filter transmissivity on temperature.

D-4162

Znamenskii, A. A.
COMPARISON OF OZONOMETRIC INSTRUMENTS MADE AT THE MAIN A. T. VOEIKOVO GEOPHYSICAL OBSERVATORY. In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 134-139, 1966.
CFSTI: TT 66-62191

A comparative study of ozonometric instruments showed that values obtained in determining total atmospheric ozone simultaneously by different instruments deviated from those recorded by the Dobson spectrophotometer by as much as 23 percent. Total atmospheric ozone curves plotted from data obtained by different instruments exhibited a general parallelism with an occasional departure. The comparative study established that a universal ozonometer was the most suitable instrument for measuring total atmospheric ozone at all points of a station network. All stations of an ozonometric network should be equipped with identical instruments, preferably of the above described universal type. Parameters of calibrated instruments should be left unchanged, so that the same instruments can be used as the standard in future comparative studies of the instruments' stability with time. It is recommended that nomograms be used by all stations of an ozonometric network for simplification and acceleration of data processing. Standardization of ozonometric instruments should be done in regions where clear air and favorable weather conditions predominate.

D-4169

Svistov, P. F.
CHEMICAL DETERMINATION OF GROUND LAYER OZONE AT VOEIKOVO. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 213-330, 1966.
CFSTI: TT 66-6291

Several methods of chemical ozone determination in atmospheric air were tested. In one method the amount of ozone was calculated on the basis of conductometric potassium iodide titration results before and after air aspiration. The second method, which is described in greater detail was based on ozone density determination by difference between iodine content in the potassium iodide before and after air aspiration. The iodine is extracted with chloroform, and its color intensity is determined photocolorimetrically.

D-4170

Romashkina, K. I.
METHODS FOR THE CALIBRATION OF ZENITHAL AND LUNAR UNIVERSAL OZONOMETER ASSEMBLIES. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone. 1965. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 220-225, 1966.
CFSTI: TT 66-62191

The proposed method of calibrating zenithal and lunar observations is essentially an empirical one. Some of the assumptions on which it is based lack verification. Therefore, the accuracy of determining total ozone determination on the basis of zenithal and lunar observations is below the accuracy of solar observations. The use of these data must be approached more cautiously, especially in research studies. Nevertheless, this method can be used advantageously in conducting continuous observations of total atmospheric ozone.

D-4241

Dmitriev, M. T. and N. A. Kitrosskii
IONIZATION METHODS FOR THE DETERMINATION OF ATMOSPHERIC POLLUTANTS. [K voprosu o primenenii ionizatsionnykh metodov pri opredelenii atmosfernykh zagryaznenii.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):63-68, July-Sept. 1966. 1 ref.

By utilizing radioelectronic means, ionization methods of determining atmospheric pollutants ensure reliability, high precision and rapid automatic recording of results. The prospects for using these methods are assessed and their theoretical principles are examined. The methods included are: thermoionization, photoionization, electric discharge, radioactivity ionization, argon ionization, electron capture, and mass spectrometry.

D-4245

Krylova, N. A.
COLORIMETRIC AND SPECTROPHOTOMETRIC DETERMINATION OF PHENYLURETHYLANE IN FACTORY AIR. [Opredelenie feniluretilana v vozdukhe proizvodstevennykh pomeshchenii kolorimetricheskim i spektrofotometricheskim metodami.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):250-255, July-Sept. 1966. 1 ref.
Phenylurethylane solution boiled with an alkali hydrolyzes to aniline and sodium acetate. Thus, the determination of phenylurethylane can be based on the determination of aniline. In the present work the diazotizing reaction of aniline was used and followed by the reaction of the diazo compound with alpha-naphthylethylenediamine. Colorimetric analysis was recommended for separate investigations of the two substances, phenylurethylane and aniline, when present together. Spectrophotometric determination of phenylurethylane in samples was also recommended. This method is non-specific as aniline interferes by yielding an absorption maximum in the same range.

D-4247

Manita, M. D.
DETERMINATION OF THE VAPORS OF MONOHYDRIC PHENOLS (PHENOL AND O-, M-, P-CRESOLS) IN THE ATMOSPHERE BY ULTRAVIOLET SPECTROPHOTOMETRY. [Opredelenie parov odnoatomnykh fenolov (fenola i orto-, meta-, para-krezolov) v atmosfernom vozdukhe metodom ul'trafioletovoi spektrofotometrii.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):260-264, July-Sept. 1966. 5 refs.

Investigation of means of differentiating the atmospheric concentration of phenol and o-, m-, and p-cresols led to experiments based on the bathochromic shift induced by alkali solutions of the above mentioned compounds. Optical densities of aqueous solutions of the phenols were measured with an SF-4 spectrophotometer in a quartz cell against distilled water; optical densities of their alkali solutions were then determined against appropriate alkali solutions. It was observed that alkali solution of phenol has a maximum absorption at the wavelength of 235 millimicrons whereas the neutral solution of the same concentration has practically no absorption at this wavelength. Similar absorption phenomena can be observed in the case of o-, m-, and p-cresols. Density differences between the aqueous alkaline sample solution and the aqueous neutral sample solution allow the concentration of the phenol to be calculated. Differences in absorption intensities between phenol and o-, m-, and p-cresols make possible their separate identification.

D-4248

Aigina, E. P. and I. M. Mints
DETERMINATION OF LOW 3,4-BENZPYRENE CONCENTRATIONS BY MEANS OF THE SHPOL'SKII EFFECT. [K voprosu o kolichestvennom opredelenii malykh kontsentratsii 3,4-benzpirena s pomoshch'yu effekta Shpol'skogo.] Hygiene and Sanitation (English translation of: Gigiena i Sanit), 31(7-9):264-270. July-Sept. 1966. 6 refs.

The use of quasilinear fluorescence spectra for the quantitative determination of 3,4-benzpyrene is said to increase the sensitivity by 2 or 3 orders of magnitude in comparison to the spectrophotometric method. The known procedures suffer from several disadvantages. The purpose of the present work was the development of a better procedure A new procedure was devised for the quantitative determination of 3,4-benzpyrene without an internal standard, by using the mercury line of wavelength 390.6 nm (3906 A) as the reference line, and the advantage of using this line was demonstrated. The range of determinable concentrations lies between 0.002 and 0.05 microgram/ml. The relative standard deviation for a single analysis is 26 percent. A cruder qualitative determination of 3,4-benzpyrene is also possible for lower concentrations of this substance. The new procedure ensures a higher sensitivity than Dikun's procedure (approximately by one order of magnitude) and moreover is considerably simpler, more readily available, and less labor consuming. A procedure was devised for a quantitative determination of 1,12-benzperylene in the concentration range of 0.02 - 2 microgram/ml. The relative standard deviation is 36 percent.

D-4249

Selivokhin, P. I.
DETERMINATION OF TIN TETRABUTYL AND TIN TETRAETHYL IN FACTORY AIR AND IN SEWAGE (CONDENSATE). [Opredelenie tetrabutilolova i Tetraetilolova v vozdukhe proizvodstevennykh pomeshchenii i stochnoi vode (kondensate.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):270-272, July-Sept. 1966. 5 refs.

Because of the toxicity of tin tetrabutyl (TTB) and tin tetraethyl (TTE) and their potential presence in the air where organic tin products and plastics are in process, a means of detecting them was desired. The method discussed is based on the mineralization of TTB and TTE with perhydrol in concentrated H_2SO_4 medium followed by colorimetric determination of the Sn(4+) ion in the form of a yellow-orange compound by the method of standard series or with a photoelectrocolorimeter. The sensitivity is 0.1 microgram/sample. Interference of Fe(3+) and Sb(3+) is eliminated by addition of ascorbic acid. The method is suitable for determination of other organo-tin compounds that may be present together with TTE and TTB.

D-4254

Tsupikov, M. T. and A. I. Grigorenko
RAPID METHODS FOR THE DETERMINATION OF TERTIARY FATTY ALCOHOLS, LOWER KETONES AND XYLENES IN AIR. [Bystrye metody opredeleniya tretichnykh zhirnykh spirtov, nizshikh ketonov i ksilolov v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(7-9):418-421, June-Sept. 1966.

The method for determination of tertiary fatty alcohols and lower ketones is based on adsorption of vapors of these substances on silica gel, followed by acid-thermal condensation with vanillin to obtain colored reaction products. The reaction consists of an acid-thermal condensation on silica gel of vanillin as a reagent with active methylene alkyls that are directly bound with the C-OH group in tertiary alcohols or with the CO group in ketones. The intermediate reactions produce unsaturated hydroxy ketones or alcohols resembling curcumins in their chemical structure; these substances are converted to dyes of a complex composition by the acid-thermal factor. The procedure is as follows: A thin short length of rubber tubing is attached to the syringe of the air-sampling device. The narrow end of the tube with silica gel (which is open at both ends) is connected to the air-sampling device and a measured volume of air is pumped through. The tube is disconnected, 4 or 5 drops of the solution of vanillin-sulfuric acid are introduced and the tube is shaken until the silica gel is completely impregnated. The silica gel layer is then heated in a flame. On cooling, the length of the colored silica gel layer is measured. A blank test is performed in parallel, without the pumping through of air. The concentration of substances in the measured volume of air passed through the silica gel is found by means of a graph, in which the length of the colored silica gel layer is marked on the x-axis (in millimeters), while the concentrations (milligrams) are marked on the y-axis. The concentration is converted to milligrams per liter by means of the formula: $X = a.1000/b$, where X is the concentration of the substance in question (mg/l), a is the concentration of the substance in the volume of air passed through the tube (mg), and b is the volume of air (ml). The method for determination of commercial xylene is based on the production of red-colored anils by the reaction of xylenes with urotropinsulfuric acid on silica gel.

D-4255

Bykhovskaya, M. S. and R. N. Makedonskaya
DETERMINATION OF ALIPHATIC AMINES IN AIR. [K metodike opredeleniya alifaticheskikh aminov v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(9):421-425, July-Sept. 1966. 13 refs.

In studies of the primary aliphatic amines, optimum conditions were studied for their determination with ninhydrin, potassium 1, 2-naphthoquinone-4-sulfonate and p-nitrophenyldiazonium. The best reproducibility was achieved in an aqueous-pyridine solution with the addition of a little ascorbic acid. The reaction product imparts a blue-violet color to the solution, as distinguished from the control solution which displays a pinkish-violet color. The maximum light absorption of the solution occurs at the wavelength of 575 OA. The sensitivity is 1 microgram in the volume analyzed. In the concentration range of 1 to 10 micrograms there is a linear relationship between the optical density and the amine concentration in solution. No interference is caused by secondary and tertiary aliphatic amines or by aromatic amines. Any ammonia interferes with the determination, because its presence in the sample to the extent of 1 microgram colors the solution an intense blue-violet. The most selective reaction for the determination of secondary amines is based on the formation of copper dialkyldithiocarbamate. Where an air sample is taken in ethanol, and 0.1 ml of 15 percent alcohol solution of CS_2, 0.1 ml of 0.1 percent alcohol solution of copper acetate and 0.1 ml alcohol solution of NH_3 are added to the 2-ml sample. The addition of each reagent is followed by mixing of the solution. After 10 minutes the intensity of the colored sample is compared against the standard scales, or else the optical density of the solution is measured in a cell. A method for the determination of trimethylamine in air using a citric acid solution in acetic anhydride was developed. Reactions with citric acid and acetic anhydride as well as those with phosphotungstic or phosphomolybdic acids may also be applied to studies of several tertiary amines, no interference being caused by secondary and (other) tertiary amines.

D-4257

Gol'dberg, E. Kh.
PHOTOMETRIC DETERMINATION OF SMALL AMOUNTS OF VOLATILE MINERAL ACIDS (HYDROCHLORIC AND NITRIC) IN THE ATMOSPHERE. [Fotometricheskoe opredelenie malykh kolichestv letuchikh mineral'nykh kislot (solyanoi i azotnoi) v atmosfernom vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 31(9): 440-443, July-Sept. 1966.

A spectrophotometric method was recommended for the analysis of low concentrations of mineral acids in the atmosphere. However, it is not always possible to use this method at the laboratories of the district sanitary-epidemiological centers because of the absence of a spectrophotometer. Modification of the spectrophotometric method for purposes of photometric determinations with a photoelectrocolorimeter required a calibration graph for the relationship between the optical density and the concentration of hydrogen ions in micrograms per 1 ml for an FEK-56 photoelectrocolorimeter. Standard solutions were prepared from fresh 0.005 N HCl and HNO_3. Solutions were made containing 0.005 to 0.02 microgram/ml H^+. A zero solution (distilled water) was prepared simultaneously. In all cases, an addition was made of 0.4 ml 0.01 percent alcohol solution of methyl red. The optical density of standard solutions and of a zero solution with the methyl red reagent was determined with respect to distilled water. This photometric technique made possible the establishment of constant optical densities of aqueous solutions of acids in the standard scale, independent of the pH of the distilled water used. The sensitivity of the photoelectrocolorimetric method and the sampling procedure are the same as for the spectrophotometric method. Studies were also made of the possibilities of visual colorimetric determinations. It was found that in the absence of a photoelectrocolorimeter the solutions can be determined colorimetrically by visual means by the method of standard series with an artificial scale.

D-4392

Tuma, J.
DUST PROPERTIES WHICH AFFECT SEPARATION. STAUB (English Translation), 26(11):1-6, Nov. 1966. 7 refs.

The relationship between various methods for particle-size determination is analyzed. The physical principle of the measuring method must always be considered in the assessment of results of particle size measurements. Methods and instruments for the determination of electrical resistance, adhesion properties, vibration properties, wettability and abrasion properties of dusts are described.

D-4472

Kulikova, G. I., G. T. Nikandrova, and V. A. Petrushevskii
ACCURACY OF DETERMINING CLOUD BOUNDARIES BY RADAR. [Tochnost' izmereniia granits oblakov radiolokatsionnym metodom.] Glavnaia Geofizicheskaia Observatoriia, Trudy, No. 173, p. 9-18, 1965. 6 refs. Translated from Russian. American Meteorological Society, Feb. 1966.

The aim was to determine how closely radar characteristics agree with meteorological characteristics and, particularly, how the heights of radar reflections are related to the heights of cloud tops. In the autumn of 1963, simultaneous radar and aircraft observations were made in order to compare the radar echo pattern with the characteristics of the cloud field and to study the errors of the cloud-top heights. The characteristics of the field of the cloud-top heights were in good agreement with the characteristics obtained by observation from the aircraft. The minimum thickness of cumulus clouds detectable by the weather radar was 1.0 to 1.2 km. In cloud systems of stratiform clouds, the weather radar cannot detect individual layers with a thickness of 0.2 to 0.3 km. The height of the upper limit of reflections from clouds detected by a weather radar coincides with the visual boundary of the clouds, to the accuracy of the reading. The experimental value of the mean square error of RHI measurement of the height of cloud tops is 0.21 km. The bottoms of low, middle, and high clouds can be detected with an efficiency of 0.3, 0.8, and 0.9, respectively.

D-4484

Zhdanov, S. P., A. P. Kiselev, and Ya. I. Yashin
USE OF COARSE POROUS GLASS IN GAS-ADSORPTION CHROMATOGRAPHY FOR THE SEPARATION OF LIQUID HYDROCARBONS. Neftekhimiya, 3(3):417-424, 1963. 13 refs. Translated from Russian. Foreign Technology Division, Wright-Patterson AFB, Ohio, Jan. 1966. 15 p.

The possibility of using coarse porous glass for the separation of normal alkanes and aromatic hydrocarbons with boiling temperatures up to 150 degrees by the method of gas-adsorption chromatography was investigated. The dependence of the effectiveness of the coarse porous glass column on the linear speed of the gas-carrier indicated the possible use of such columns at great linear speeds. From the chromatograms taken at various temperatures, the adsorption heats of a series of hydrocarbons on the hydroxylated surface of silicon were determined. The adsorption heats of normal alkanes and normal alkyl benzenes increase linearly with the increase in the number of carbon atoms in the molecule. The adsorption heat of ethylene is greater than that of benzene, and that of alkyl benzene is greater than that of the corresponding n-alkanes because of the specific interaction, primarily of the electron bonds with the hydroxyl groups of the surface. The values determined from the chromatograms of heat adsorption were close to those obtained calorimetrically.

D-4759

Hodkinson, J. R.
THE INTERPRETATION OF MIE-THEORY COMPUTATIONS FOR ABSORBING SPHERES IN RELATION TO LIGHT-SCATTERING METHODS OF AIRBORNE DUST MEASUREMENT. Translated from German. STAUB, Vol. 23, p. 374-378, 1963.

Mie-theory computations of the angular scattering diagrams of moderately absorbing spherical particles larger than the wavelength have been published by OLAF and ROBOCK (1961), and the application of these results to the interpretation of light-scattering measurements on such particles has been discussed by ROBOCK (1962). This note compares these Mie-theory results with simpler computations of the angular scattering by moderately-absorbing spheres from the formulae of large-particle classical optics; points out that the Mie-theory does not apply to irregular particles such as constitute the airborne-dust clouds in mines; and discusses briefly the principles governing the measurement of dust concentration by light-scattering methods.

D-4814

Odelycke, P.
COMPARATIVE INVESTIGATIONS OF VARIOUS DUST MEASURING INSTRUMENTS. STAUB (English Translation), 26(12):18-24, Dec. 1966. 9 refs.

Four dust measuring methods for the determination of particle size (membrane filters, midget-impinger, Sartorius HS and Witwatersrand konimeter) were compared in an iron ore mine. It was found that the first three methods did not give good agreement. In contrast to this there was good agreement between the results obtained by the two konimeters. In addition some filtering methods for the determination of total dust concentration and very fine dust concentration were tested for different operations. (Author's summary)

D-4815

Lahmann, E.
DETERMINING PHENOL IN AIR. STAUB (English Translation), 26(12):24-29, Dec. 1966. 23 refs.

Impingers charged with 0.1 n caustic soda solution are suitable for absorption of gaseous phenols. By photometric determination using p-nitraniline it is possible to detect 0.01 mg phenol/m^3 of air. The measuring method is simple in operation and gives reproducible results, but its disadvantage is that phenolic compounds can only be expressed as a sum. Measurements carried out in industrial regions and in streets with heavy traffic have predominately shown low phenol emissions which are only a fraction of the MIK permanent value. (Author's summary)

D-5045

OPTICO-ACOUSTIC GAS ANALYZERS OF CARBON MONOXIDE, CARBON DIOXIDE AND METHANE, 0A2109,

OA2209, OA2309. DESCRIPTION AND INSTRUCTIONS FOR ASSEMBLING AND OPERATION, NO. 2266-2292 IM. Translated from Russian. Joint Publications Research Service, Washington, D. C., 27p., Feb 11, 1965.
CFSTI: TT 65-30309

Gas analyzers are described of the OA2109, OA2209, and OA2309 type stationary, automatic-recording instruments which are designed for continuous measurement of the concentration of CO (OA2109), CO_2 (OA2209), and CH_4 (OA2309) in gas mixtures containing CO, CO_2, N_2, O_2, CH_4, and H_2 in any amounts. In the determination of the concentration of CO_2 (gas analyzer OA2209), the variation in the total content of methane and hydrogen may not exceed plus or minus 15 percent of its mean. The gas analyzers may be used for technological control in the metallurgical, chemical, petroleum refining, petro-technical, and gas industry, as well as in various fields of scientific research. The instruments may be used in different systems of automatic control or in systems for signaling the attainment of pre-set values of concentration of the components to be assayed. The operation of the optico-acoustic gas analyzer is based on measuring the absorption of IR radiation by gases. The degree of this adsorption depends on the concentration of the measured component and the analyzed gas mixture. A differential optical circuit serves as the analyzer measuring circuit. An automatic recorder serves to register the concentration of the measured component (in percent by volume).

D-5072

Berner, A.
MEASURING PRECIPITATIONS OF DOP AND PARAFFIN OIL AEROSOLS IN THE GOETZ AEROSOL SPECTROMETER. [Zur Messung der Niederschläge von DOP und Paraffinolaerosolen im Goetzschen Aerosolspektrometer.] STAUB (English Translation), 26(7):49-50, July 1966. 3 refs.
CFSTI: TT 66-51159/7

An optical method for measuring oily liquids in filter papers is described. In this method, the light transmission of paper, which changes with absorption of substances, is determined photometrically and related to the absorbed substances. Calibration curves are given.

D-5121

Zwang, L. R. and L. N. Gutman
MEASUREMENT OF LIGHT ATMOSPHERIC ION SPECTRA. Translated from Russian. Acad. Sci., USSR, Bull. Geophys. Ser. (Izv. Geophys. Ser. 1953, p. 891-902.) No. 7, p. 507-512, 1953. 4 refs.

A method of solving the integral equations which are characteristic of transient processes in ion chambers is presented. Geophysical results, obtained from measurements of light atmospheric spectra in the El'brus expedition of the Academy of Sciences, USSR, are discussed. The essence of this method is presented. A sample of the air under investigation is admitted into a cylindrical ion chamber which is then closed and a constant voltage is applied to its outer electrode. An ionic current begins to flow inside the chamber; it is caused by the motion of ions contained in the air sample. This current decreases with time, because at first the more mobile, and afterwards the less mobile ions reach the electrodes of the chamber. By measuring the magnitude of the current at various instances of time, one can determine ionic spectrum. The magnitude of the current flowing through the central electrode of the chamber is related to the mobility-distribution density of the ions n (w) through an integral equation.

D-5210

DETERMINATION OF CARBON TETRACHLORIDE IN AIR. Zavodsk. Lab., 23(2):161-162, 1957. 7 refs. Translated from Russian. Office of Technical Services, Dept. of Commerce, Washington, D. C., 3p.
CFSTI: TT 63-14127

Determination of carbon tetrachloride and chloroform by colorimetric analysis is discussed. The method involves application of the condensation reaction between 2, 4-dinitrochlorobenzene and pyridine to form pyridinium chloride, which is converted by hydrolysis to glutaconic aldehyde and 2, 4-dinitroaniline. The color reaction depends on the formation of derivative of glutaconic aldehydes and reaction of the latter with aniline. A standard scale of colored solutions was established to evaluate the concentrations. It is possible to determine 1 gm of carbon tetrachloride (CCl_4) in 1 ml of solution with an average error of 4.5 percent. In the case of chloroform ($CHCl_3$), 0.5 gm per ml can be analyzed.

D-5216

TENTATIVE METHOD FOR CALCULATIONS OF THE DISPERSION OF DISCHARGES IN THE ATMOSPHERE. Byul. Stroit. Tekhn., Vol. 11, p. 29-31, Nov., 1963. Translated from Russian. Joint Publications Research Service, Washington, D. C., 6p., Jan. 3, 1964 (2nd Printing - July 22, 1965)
CFSTI: 64-21206

On 25 July 1963, the State Committee on the Coordination of Scientific Research Work U. S. S. R. confirmed "Tentative Procedure for Calculating the Dispersion in the Atmosphere of Discharges from the Smokestacks of Electric Power Plants." Development of theory of turbulent diffusion, as well as new experimental data made it possible to compile a procedure for calculating the dispersion of smokestack discharges from electric power plants in the atmosphere, to determine stack height requirements, and establish standardization of discharges. The degree of danger of contamination of the ground layer of air by discharges from the stacks of electric power plants should be determined according to the greatest value of the ground concentration of harmful impurities in the air (c_M), which can be established at some distance from the stacks (x_M) under unfavorable meteorological conditions. In this case the value of the maximum concentration c_M (in mg/cu m) on level or slightly broken terrain, with a uniform discharge of toxic substances from stacks (N) of the same height should be calculated according to the formula: $c_M = AMFm/H2(N/V\ d\ T)^{1/3}$; where A is a coefficient depending on the temperature stratification of the atmosphere, which determines the conditions of vertical and horizontal dispersion of the impurity in the air (in sec 2/3 deg 1/3); M is the summary discharge of the toxic impurity from all the stacks (in g/sec); H is the height of the stack (in meters); V is the summary volume of smoke gases discharged from the stacks per second (in cu m/sec); dT is the difference between the temperature of the gases emerging from the stack and the temperature of the surrounding air (in deg); m and F are dimensionless coefficients: the coefficient m is related to a consideration of the influence of the rate of emergence of the smoke gases from the mouth of the stack, while the coefficient F is related to a consideration of the influence of the rate of settling of the impurity in the atmosphere. This formula is suitable for calculating the concentration of impurities emerging from smokestacks at H greater than 50 m; V/N greater than 20 cu m/sec, and dT greater than 30 degrees. When the contour of the terrain does not correspond to the conditions indicated above, special instructions must be sought from the Main Administration of the Hydrometeorological Service under the Council of Ministers

U.S.S.R. and the State Sanitary Inspection U.S.S.R.

D-5376

Khrustalev, V. A.
DETECTION OF PHENOL IN THE ATMOSPHERE WITH 4-AMINOANTI-PYRENE. Translated from Russian. Gigiena i Sanit., 27(10):42-45, Oct. 1962. 5 refs.

In the detection of phenol by the use of 4-A.A.P. (4-aminoantipyrene), it was established that dimethyl p-cresol, acetophenone, alphamethyl-styrene, diethyl ether, isopropyl alcohol, hydroperoxide of isopropyl benzene, benzene, dimethyl phenylcarbinyl; ethyl- and butyl-benzene do not interfere. In the detection of phenol with diazotized p-nitroaniline, presence of dimethyl p-cresol interferes to the extent of 0.7 microgram which attests to the expediency of the use of the 4-A.A.P. and not of the diazotized p-nitroaniline. The absorption of phenol from air can be achieved by liquid media or solid sorbent. The use of 0.05 M solution of sodium borate, of which 3 or 6 ml should be put into a V-shaped absorber with a No. 1 porous membrane is recommended for liquid media. It is possible to carry out the liquid media absorption of phenol at a speed of 5 L/min. Silica gel in suspension was used as the solid absorbent. Absorption rates for complete absorption here were 5-10 L/min. The use of ethyl alcohol effected complete extraction of the phenol from the silica gel in 15 min. Results of these studies are presented in diagram. The rose color of the sample in the 0.1 percent aqueous 4-A.A.-P. solution was compared with the standard curve.

D-5377

Kiktenko, V. S., Yu. P. Safronov, S. I. Kudryavtsev, R. I. El'man, B. F. Fedorov, N. I. Pushchin, and A. A. Fedorovich
PHOTOELECTRIC COUNT OF THE NUMBER OF AEROSOL PARTICLES OF ORGANIC AND INORGANIC ORIGIN. Gigiena i Sanit., 26(2):47-53, Feb. 1961. 4 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 12p., May 25, 1961.
CFSTI: TT 61-23112

The application of a photoelectric unit consisting of a photoelectric multiplier, an amplifier, an SB-1M electro-mechanical counter and power source, to the counting of aerosol particles was investigated. When used together with a VDK flow ultramicroscope, the photoelectric unit is adaptable to the counting of aerosol particles of organic and inorganic origin in an objective, rapid and accurate manner. When used as supplementary instrumentation, the photoelectric unit and electromechanical counter can be used with the flow ultramicroscope to perform an automatic count of bacterial aerosol particles in an aerosol chamber.

D-5951

Alekseeva, N. V.
METHODS FOR THE DETERMINATION OF ATMOSPHERIC POLLUTANTS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VI.] V. A. Ryazanova (ed.). Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1), p. 107-133, 1962.
CFSTI: TT 64-11574

Development in the synthesis of high molecular compounds resulted in the production and utilization of many new organic substances by the U.S.S.R. national industries. Plants producing these substances and their intermediate products discharge into the air gases, vapors, and by-products as surrounding atmospheric air pollutants the detection and quantitative determination of which require special and highly sensitive analytical methods. Methods are described for the detection of acetic acid esters, acetates, dinyl, isopropylbenzene, furfurol, ethylene oxide, monobasic carbonaceous acids, methylmetacrylate, dimethylformamide, and isopropylbenzene hydroperoxide. An index of allowable concentration limits for harmful substances in atmospheric air of inhabited areas is appended.

D-5958

Baikov, B. K. and V. I. Shul'gin
AN AUTOMATICALLY REGULATED APPARATUS FOR CHRONIC TOXICITY EXPERIMENTS WITH ANIMALS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VII.] V. A. Ryazanova (ed.). Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2), p. 200-203, 1963.
CFSTI: TT 64-11574

The hygienic evaluation of atmospheric air pollution intensity is based on maximal single and average 24 hours limits of allowable concentrations of harmful substances. The determination of limits of allowable average 24-hour concentrations of a harmful substance in the air is accomplished with the use of experimental animals, which in most cases are exposed to the effects of pollutants for not less than 24 hours. It is essential that automatically and reliably operating equipment be developed which might enable an individual investigator to take full and uninterrupted charge of the experiment. The device described makes possible the following: (a) Automatic switching in and out of the motor sets at given time intervals; (b) Automatic switching over from one set of motors to another or from the city current to storage battery current in emergencies; and (c) Automatic switching over from overheated motors to a new set of motors. In the event of a breakdown in the original source of electrical energy, the motors become automatically connected with storage batteries to insure the motors' uninterrupted operation.

D-5959

Alekseeva, M. V. and P. G. Tkachev
METHODS FOR THE DETERMINATION OF SOME ORGANIC ATMOSPHERIC AIR POLLUTANTS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VII.] V. A. Ryazanova (ed.). Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2), p. 203-212, 1963.
CFSTI: TT 64-11574

Methods are described for the determination of aniline, xylol, n-butyvinyl ester and dimethylterephthalate in the atmosphere. Standard color scales are also included for the quantitative determination of xylol, n-butylvinyl ester and dimethylterephthalate (DMTPH). A method for the determination of phenol with 4-aminoantipyrine is described and standard color scales for the quantitative determinations are included.

D-5960

Manita, M. D.
DETERMINATION OF SOME AIR POLLUTANTS BY THE SPECTROPHOTOMETRIC METHOD IN THE ULTRAVIOLET REGION OF THE SPECTRUM. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VII.] V. A. Ryazanova (ed.). 3 refs. Translated from Russian by B. S. Lenine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2), p. 213-220, 1963.
CFSTI: TT 64-11574

The principle of the SF-4 spectrophotometer operation is discussed. Analyses are divided into two categories: (1) for analysis of air containing 1 (one) pollutant and, (2) in which two air pollutants are determined simultaneously. Mathematical formulae are included. Also included are methods for the spectrophotometric determination of naphthalene in indoor air; isopropyl benzene in air; and styrol in the presence of dinyl in air. A list of limits of allowable concentrations of atmospheric pollutants is appended.

D-6332

ASPIRATOR FOR TAKING AIR SAMPLES --MODEL 822. [Aspirator dlya otbora prob vosdukha--model' 822.] Krasnegvardeyetes Order of Lenin Plant, p. 1-14, June 16, 1961. Translated from Russian. Joint Publications Research Service, Washington, D. C., 9p., March 25, 1963.
CFSTI: TT 63-21418

The aspirator is used for sampling air in industrial and non-industrial buildings for the purpose of studying and analyzing the air. The sample is taken by drawing air through special filters at a fixed rate. The device has (1) air blowers developing a negative pressure, (2) rotameters for measuring the rate of the air's passage, and (3) a component for controlling the rate of the air's passage. Using this system, it is possible to determine the amount of impurities being contained per unit of air volume. Instructions and technical specifications with diagrams are given.

D-6336

Lyutsarev, S. V.
INSTRUMENT FOR DETECTING CARBON DIOXIDE IN ATMOSPHERIC AIR. Tr. Inst. Okeanol., Akad. Nauk SSR, Vol. 47, p. 199-200, 1961. 4 refs. Translated from Russian. Foreign Technology Division, Wright-Patterson AFB, Ohio, 7p., Sept. 5, 1962.

A titrometric gas analyzer for the detection of CO_2 in atmospheric air is described. The distinct feature of this instrument is the fact that the gas under consideration can repeatedly pass through the absorbing solution to obtain complete absorption. It also permits the detection of CO_2 in a small volume of gas (50 ml).

D-6519

Storozhilova, A. I.
DIFFERENTIAL COUNTER FOR CONDENSATION NUCLEI. In: Investigations in the Field of Surface Forces - Selected Articles. Issled. Obl. Poverkhn. Sil., Sb. Dokl. na Konf., Akad. Nauk SSSR, p. 53-63, 1961. 6 refs. Translated from Russian. Foreign Technology Division, Wright-Patterson AFB, 11p., Nov. 15, 1962.
CFSTI: AD 292623

The continuous method developed for differential counting of the nuclei included a curvette with two moist parallel surfaces in which the condensation growth on the nuclei occurred. The jet with the nuclei that have been grown may be observed on dark-field illumination from the front of the curvette. It is necessary that the velocity of gravitational settling of the droplets be much smaller than the jet velocity to preserve rectilinearity. A count of the condensation nuclei is made visually with a miscrocope whose ocular has a vertical slit. The counting zone with a light source is in the plane perpendicular to the air flow. Results with silver iodide and sodium chloride are presented. The characteristic feature of the method consists in the fact that condensation growth occurs on the nuclei in a narrow zone with the result that the heat of condensation liberated in the zone has little effect on the value of the assigned supersaturation. The method allows the assignment of any supersaturation, the value of which may be determined to an accuracy of the order of 0.1 percent.

D-6621

Shifrin, K. S. and V. F. Raskin
THEORY OF THE OPTICAL METHOD FOR INVESTIGATING ATMOSPHERIC AEROSOLS. Tr. Soveshch. Gidrometeoizdat, Vol. 9, p. 253-260. 5 refs. Translated from Russian. U. S. Army Foreign Science and Technology Center, Washington, D. C., 12p., Nov. 1965.
CFSTI: AD 475-922

The optical method of investigation of atmospheric aerosols enables measures to be made practically without disturbance of the aerosol system. A beam of monochromatic radiation is directed on the aerosol. During interaction with the system of aerosol particles a portion of the light scatters while a portion passes through the system. Both the scattered light and the light that passes through the aerosol volume will contain information on the nature of scattering centers which has to be interpreted. Here various optical characteristics can be used: angular characteristics of the scattered light - indicatrices of scattering; data on the spectral transparency of the aerosol volume; and, finally, polarization characteristics. The possibilities of using data relating to indicatrices and scattering coefficient (spectral transparency) in order to determine the microstructure of the atmosphere are considered. With a spectral-transparency curve experimentally obtained and by means of derived formulas the particle-size distribution curve of atmospheric aerosols can be obtained.

D-6653

Razbegaeva, A. P.
MECHANIZATION OF THE GAS ANALYZER ORSAT. Koks i Khim., Vol. 4, p. 53-54, 1953. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 44-47, 1962.
CFSTI: TT 62-11103

A method for mechanical transfer of the combustion gases from the burettes into the absorption tubes is described. The apparatus consists of a water pressure flask and a rubber bulb or balloon which form an assembly unit. Each bulb is operated by a spring type pusher activated by one of several eccentric cams on a common shaft. The cams are set so that at a given time interval only one pusher is brought into action. Results of tests made with gas analyzer ORSAT manually and by the automatic procedure snow that differences between testing procedures were within error limits normal for an apparatus of this type. Adoption of the mechanical procedure of combustion gas analysis facilitated the work of the laboratory technicians, increased their productivity, and freed one technican for other laboratory work. The apparatus is now in continuous smooth operation.

D-6657

Vaskevich, D. N., A. I. Bulycheva, and P. A. Mel'nikova
RAPID METHOD FOR THE DETERMINATION OF CARBON MONOXIDE IN THE AIR OF WORKING PREMISES. Vodosnabzh. i Sanit. Tekhn., Vol. 1, p. 12-13, 1956. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 97-101, 1962.
CFSTI: TT 62-11103

The method is based on passing the tested air for 3-5 minutes through an indicator tube filled with a special white powder. As the carbon monoxide passes through the tube, the powder acquires a greenish-violet color, the intensity of which is proportional to the carbon monoxide concentration in the air. The intensity of the developed color is then compared with the color of a specially prepared standard series of tubes representing CO concentrations in the range of 0.01 - 0.4 mg/li. The procedure requires 10 minutes and the determination can be made directly on the spot. Pollutants which might interfere with carbon monoxide determinations may be caught by a special cylinder filter connected to the indicator tube in such a way that the air passes through this filter before entering the indicator tube. The cylinder contains two layers of calcium chloride and activated charcoal. In the process of air passing through the indicator tube acid vapors are given off which corrode the walls of the metallic aspirator. To eliminate this the air is passed through a tube filled with alkali saturated cotton. The proposed rapid indicator method for the determination of carbon monoxide in the air yielded reliable results under different industrial production conditions.

D-6658

Bykhovskaya, M. S.
COMPARATIVE EVALUATION OF SOME METHODS FOR THE DETERMINATION OF BERYLLIUM AND ITS COMPOUNDS APPLICABLE TO AIR ANALYSIS. Gigiena Truda i Prof. Zabolevaniya, 1(6):49-53, 1957. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 102-108, 1962.
CFSTI: TT 62-11103

Several methods for the determination of beryllium in the air are compared. The work was conducted with standard beryllium solutions and also with artificial mixtures containing fixed amounts of calcium, magnesium, iron, aluminum, zinc, and manganese. A comparative evaluation was made of the methods for the determination of beryllium by fluorescence with morine, 1-amino-4-oxyanthraquinone, 1-4-dioxyanthraquinone and by colorimetry with quinalizerin, thoron, N-resorcinol, arsenazo, and beryllon II. Simultaneously, the tests were made with trylon B the disodium salt of ethylenediaminotetra-acetic acid, in an attempt to counteract cationic interference and to separate the constituents by paper chromatographic partitioning. The most sensitive and promising methods for the determination of beryllium in the air of industrial premises are: the fluorescence method with morine and the colorimetric determination with beryllon II. Use of trylon B as a complex-former eliminated the effect of many interfering elements and made possible the determination of beryllium in the presence of calcium, magnesium, iron, zinc, aluminum, and manganese, without their preliminary separation. The spectrographic method of beryllium determination yielded promising results. The method of paper partitioning chromatography appeared promising as a semi-quantitative method for the determination of beryllium in the presence of calcium, magnesium, iron, manganese and aluminum.

D-6659

Gurvits, S. S. and T. I. Sergeva
PHENOL DETERMINATION IN THE PRESENCE OF POLYATOMIC PHENOLS IN THE AIR DURING FOUNDRY CASING POURING. Gigiena Truda i Prof. Zabolevaniya, 2(4):50-53, 1958. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 108-113, 1962.
CFSTI: TT 62-11103

The development of conditions which would permit the separation of monoatomic phenol from the wood resin mixture which also contains polyatomic phenols so that it could be reliably determined by the colorimetric method is described. A procedure was sought which would permit the microgram determination of phenol, hydroquinone, pyrocatecin, resorcin and pyrogallol simultaneously present in aqueous solution. Known quantities of phenol, hydroquinone, pyrocatecin, recorcin, and pyrogallol solutions were placed into conical flasks of 50 - 60 ml capacity, the total volume was then made to 10 ml; this was followed by the introduction of 2 ml 1N NH_4OH, 0.5 ml of perhydrol (hydrogen peroxide) mixed and left stand for 2 hours at room temperature. Excess of hydrogen peroxide was decomposed by the addition of 0.05 g MnO_2. The solution was then filtered through cotton. Quantitative determination of phenol was then made according to the diazotization of sulfanilic acid. This reaction possesses a high degree of sensitivity. Practical determinations were made in the foundry departments of "Stankolit" and in the Moscow brake producing plant. Air sample analyses were made by the old and new procedures, i.e., with and without preliminary peroxide treatment. A procedure was established for the determination of phenol in the air of foundry department for casting metallic forms using casing prepared from quartz sand held together by binders of different types of rosins and pitch tar, which permitted phenol into the surrounding air simultaneously with polyatomic phenols and other intermediate products of binder materials decomposition by the high heat used in casting. The basic principle of the new procedure is the decomposition of intermediates secondary to phenol by hydrogen peroxide, according to the method of Ioffe and Sokolov. Phenol values in excess of actual began to appear with a triple excess of polyphenols over phenol.

D-6661

Kachmar, E. G.
DETERMINATION OF BENZENE TOLUENE AND XYLENE SIMULTANEOUSLY PRESENT IN THE AIR. Gigiena i Sanit., 25(5):58-62, 1960. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 143-147, 1962.
CFSTI: TT 62-11103

The new methods in this presentation were based on the formation of azo-compounds. Benzene was nitrified with a 10 percent nitration mixture to the dinitro form, which was then reduced with metallic zinc, diazotized in the presence of concentrated hydrochloric acid by a 1.0 percent solution of sodium nitrate, and combined with m-phenylenediamine. The resulting azo-compound is of a yellow-brown color. The sensivity of this reaction is 0.005 mg in the volume used for colorimetry. A series of experiments were performed with known amounts of benzene determined on a parallel basis by the azo-compound formation and the Yanovskii reactions. Control tests showed that the presence of an equal amount of toluene and of an equivalent 60 percent amount of xylene, did not interfere with the determination. The toluene determination method consisted in the reduction of trinitrotoluene and the combination of the reduced products with diazotized sulfanilic acid. The sensitivity of the reaction was 0.01 mg of toluene in the colorimetric volume. Additional control tests showed that the presence of an equal concentration of xylene and of half the equivalent volume of benzene did not interfere with the determination. No suitable basis was found for the develment of a method for xylene determination in the presence of toluene; for this reason xylene was separated from benzene and toluene. The following studies were made: 1) conditions of benzene, toluene, and xylene absorption on silica gel; 2) conditions of desorption such as effects of temperature and air volume passed through the silica gel in order to displace the benzene, toluene and sylene. On the basis of results obtained conditions for the separation of xylene from benzene and toluene are recommended.

D-6662

Dikun, P. P.
QUANTITATIVE DETERMINATION OF LOW 3,4-BENZPYRENE CONCENTRATIONS WITH FINE STRUCTURE FLUORESCENT SPECTRUM. Vopr. Onkol., 7(7):42-53, 1961. 14 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 153-169, 1962.
CFSTI: TT 62-11103

A new method is described for the determination of lower 3,4-benzpyrene concentration than with any previous tests. This method combines the principle of spectrofluorometry with the fine structure spectral fluorescence phenomenon described by E. V. Shpol'skii. Quantitative determination is based on ratio between 3,4-benzpyrene and 1,12-benzoperilene absorption intensity lines. By the fine structure spectral fluorescent method, determinations can be made of 0.05 - 0.10 gamma or less of 3,4-benzpyrene per sample with a high degree of accuracy. Average deviation of 15 control tests was only ± 8 percent. Deviations exceeding 10 percent occurred in 3 of the 15 control tests, and none exceeded 13 percent.

D-6363

Ol'khovskaya, Z. K. and F. S. Nul'man
THE DETERMINATION OF OMNOPON IN AIR AND WASHINGS. [Opredelenie soderzhaniya omnopona v vozdukhe i smyvakh.] Hygiene and Sanitation (English Translation of Gigiena i Sanit.), 30(4):72-75, April 1965.

Methods have been devised for the quantitative determination of morphine and other constituent alkaloids of Omnopon in pharmaceutical plant air and in washings from worker's skin. Morphine is determined colorimetrically by its reaction with potassium ferricyanide, the sensitivity being 0.005 mg in the volume analyzed. The other Omnopon alkaloids are determined nephelometrically with silicotungstic acid, the sensitivity being 0.02 mg in the volume analyzed. These methods are suitable for controlling the hygienic condition of the factory concerned, by establishing the presence or absence of the alkaloids in question. (Authors' abstract, modified)

D-6873

Kal'manovich, F. L.
THE USE OF A SIMPLIFIED GAS ANALYZER (TG-5A) FOR THE DETERMINATION OF LOW CONCENTRATIONS OF CO_2 IN THE AIR. [Opyt ispol'zovaniya uproshchennogo gazoanalizatora TG-5A dlya opredeleniya malykh kontsentratsii uglekislogo gaza v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(5):233-236, May 1965. 3 refs.

For routine determination of carbon dioxide, the Sendrikhina gas analyzer for the determination of carbon monoxide and hydrocarbons was modified and proved to be suitable for the determination of CO_2 in the air. The accuracy of the method was tested by parallel determinations of CO_2 in the modified gas analyzer and by Rehberg's method. In 30 samples taken with CO_2 concentration ranging from 0.035 to 0.23 vol. percent, the results were identical in 17 cases and in the remaining 13 the difference amounted to plus 0.002 vol. percent.

D-6876

Lagoshnaya, R. M. and N. A. Zhuravleva
DETERMINATION OF FREON-22 IN AIR. [Kolichestvennoe opredelenie freona-22 v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(6):366-371, June 1965. 7 refs.

The colorimetric and manometric methods for the determination of freon-22 in the air are described. The colorimetric method is applicable for freon-22 concentrations in the air ranging from 0.5 to 0.00006 percent and the analytical time is approximately five minutes. The manometric method makes possible the determination of freon-22 in the air for concentrations ranging from 0.5 to 15 vol. percent and the analytical time is 10 to 15 minutes.

D-6881

Razumov, V. A. and T. K. Aidarov
COMPARATIVE EVALUATION OF CERTAIN METHODS FOR THE DETERMINATION OF LEAD AEROSOLS. [Stravnitel'naya otsenka metodov opredeleniya aerozolei svintsa v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(1):48-50, Jan. 1965. 2 refs.
CFSTI: TT 66-51033

Industrial-sanitary chemistry is making a continuously increasing use of rapid and objective instrumental methods (physical and physicochemical) in addition to purely chemical analytical methods. Regrettably, no published comparative data are available on the employment of (different) instrumental methods for analysis of the same substances, including lead. The authors decided to fill this gap by investigating the advantages and disadvantages of the spectrographic, spectrophotometric, polarographic, and photocolorimetric methods in the analysis of lead. In order to reveal the maximum possibilities of these methods, the tests for lead in air samples were preceded by determinations of its trace amounts in pure solutions. The results for analyses of identical lead concentrations in pure solutions show that the spectrographic and colorigraphic determinations are fairly close to one another, while the spectrophotometric and phototurbidimetric and analytical errors are somewhat smaller. Under their experimental conditions, the minimum detectable concentrations of lead were 0.000005 percent with the spectrographic method, 0.00003 percent with the polarographic method, and

0.0002 percent with the spectrophotometric and phototurbidimetric methods. Comparative data on the determination of lead in air by the same method show certain quantitative differences in the analytical results. This probably should be explained by the different chemical preparation of the samples for analysis. Therefore, in determining lead in air by any of the methods under consideration, account must be taken of the accuracy of the method calculated from actual samples. Before actual use of any specific method one must carry out preliminary work to achieve maximum sensitivity and to reduce the error according to the actual analytical objects. Of the methods tested, preference is given to the spectrographic method which is the most sensitive and rapid; the number of elements to be determined simultaneously must also be considered.

D-6888

Slavgorodskii, L. P.
DETECTION OF PHTALIC ANHYDRIDE IN THE ATMOSPHERIC AIR BY A SPECTROPHOTOMETRIC METHOD. [Opredelenie ftalevogo angidrida v atmosfernom vozdukhe spektrofotometricheskim metodom.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(2):227-230, Feb. 1965. 5 refs.
CFSTI: TT 66-51033

An attempt was made to determine phthalic anhydride in the air by a spectrophotometric method. Ethanol was selected as the solvent. The optical densities of alcohol solutions with different phthalic anhydride concentrations were determined and it was found that optical density was dependent on the concentrations of the test solutions. In the determination of phthalic anhydride in the atmospheric air, 100 to 200 liters of air was passed through an FPA-15 filter, fastened in a special cartridge, and two absorbers with a porous plate No. 2, each containing 10 ml of ethanol, at a rate of 1 liter/min. Considering the ability of phthalic anhydride to sublimate and condense, in collecting the samples the author provided for the use of the FPA-15 filter to absorb the solid phase of the aerosol, and 96 percent alcohol to absorb the vapors. The sensitivity of the spectrophotometric method of determining phthalic anhydride in the atmospheric air is 2.5 µg/ml. The method is nonspecific. The presence of other compounds possessing absorption in the working region of the spectrum interferes with the determination.

D-6889

Antoshechkin, A. G.
INSTRUMENT FOR DETERMINING THE CONCENTRATIONS OF NITROGEN OXIDES AND NITRIC ACID FUMES IN AIR. [Pribor dlya opredeleniya kontsentratsii okislov azota i parov azotnoi kisloty v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(2):234-236, Feb. 1965.
CFSTI: TT 66-51033

An instrument was designed and tested for the determination of the concentrations of nitrogen oxides and nitric acid fumes in air. The action of the instrument is based on measurements of the electrical conductivity of a solution obtained by drawing the air with nitrogen oxides through distilled water. The instrument is portable, its design is simple and it can be constructed under laboratory conditions. Its sensitivity is from 0.0003 to 20 mg nitrogen oxides per liter of air. One analysis takes 1 to 2 min. Thirty ml of distilled water is introduced with the syringe into the upper tube and into the vessel. The water cannot leave the vessel because of the valve, and it forms a 1-cm layer between the two electrodes. Now the pump is attached and 5 l of air are drawn in distilled water. Nitrogen oxide from the air combines with water to produce nitrous acid. The higher the concentration of nitrogen oxide in the air, the higher will be the concentration of the HNO_2, solution in the vessel. Since HNO_2, like HNO_3, is a strong electrolyte and completely dissociates to ions in dilute solutions, the electrical conductivity of the solution is proportional to the concentration. The electrodes are fed with a constant voltage from a 4.5V source. In using the instrument, one must remember that interference is caused by gases that are readily soluble in water and produce a strong electrolyte on solution (the sulfuric acid fumes). After suitable graduation, the instrument can also be used for the determination of sulfuric acid fumes in air.

D-6890

Atlasov, A. G.
DETERMINATION OF THE OPTIMUM VOLUME OF AIR WHEN TAKING SAMPLES FOR ANALYSIS OF HARMFUL SUBSTANCES. [Opredelenie optimal'nogo o'ema vozdukha pri otbore prob na vrednye veshchestva.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(2):272-275, Feb. 1965.
CFSTI: TT 66-51033

The purpose of sample collection is the complete trapping of the substance to be analyzed from the air; it should be present (in the sample) in an amount sufficient for its reliable determination by the method adopted. The least content of the substance that should be present in the sample is established by the sensitivity of the method of analysis used. Conclusions: 1. Formula was proposed for computing the optimum volume of air in the collection of air samples for analysis for harmful substances. 2. It was shown for individual examples that for certain substances the practical handbook on industrial sanitary chemistry recommends air volumes that are too low and do not provide the necessary accuracy of the analyses. 3. The proposed formula permits the refinement of the air volumes drawn through the absorbing system during collection of the samples, as a function of the industrial conditions and the problem posed in the monitoring of the atmosphere.

D-6893

Belyakov, A. A. and V. G. Smirnova.
DETERMINATION OF FURFURAL IN THE AIR. [Opredelenie furfurola v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(3):390-391, Mar. 1965. 3 refs.
CFSTI: TT 66-51033

Methods based on color reaction with aniline have been proposed for determining furfural vapors in the air of industrial premises. The reaction results in the formation of dianilide of oxyglutaconic aldehyde, belonging to the class of polymethine dyes. A common defect of these methods is the instability of dyed solutions, which is reflected in the reproducibility of the results. Using the above-mentioned reaction, the authors were able to find the conditions for a more reliable determination of furfural in the air. They used 98 percent of icy acetic acid as the absorbent solution and solvent. An aniline concentration within the limits of 50-70 mg per ml of acetic acid is preferable. In this case the dying of the solutions reaches the maximum in 15 minutes and is preserved unchanged for the next 45 minutes. Furfural vapors are well absorbed by acetic acid. To determine, for instance, the maximum permissible concentration of furfural (0.01 mg/l), it suffices to pass not more than 25 ml of air through an absorbing instrument with 2 ml of acetic acid. The air humidity is apparently little detained by the icy acetic acid. Thus, the sucking of up to 10.1 of air through the absorbing instrument with 2 ml of acetic acid containing 0.5 - 5 µg of furfural is not reflected in the results of the determination.

D-6394

Razumov, V. A. , and T. K. Aidarov
A FAST METHOD FOR DETERMINING LEAD IN THE AIR. [Uskorennyi metod opredeleniya svintsa v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(3):392-394, Mar. 1965. 5 refs.
CFSTI: TT 66-51033

In a number of cases there is a need for rapid and accurate determination of the lead aerosol content in the air. The usual chemical and physicochemical methods applied for this purpose are rather lengthy and labor-consuming. The most advantageous is color reaction on paper without any previous working of the ground. The fullest response to all requirements is afforded by the color reaction with tetrahydroxy-p-benzoquinone. Here a legible scale is obtained for microgram parts of lead on paper, the pink coloring lasts for up to six months, and the reagent solution itself is stable for up to 4 months. Antimony, bismuth, zinc, copper, iron, arsenic, chromium and calcium, also cadmium (in equal concentrations with lead) do not interfere with determination. The air sample was taken out with an aspirator plant at a rate of 3 l/min onto filter paper (blue band). When the lead content is within the normal limits, 10-15 l of air have to be taken. A disk of paper 17 mm in diameter was placed in a plexiglas holder of the proper dimensions, and a drop (0.05 ml) of reagent was applied to the filter in the holder; after it had dried, samples were taken, and then a drop (0.05 ml) of buffer solution was applied. The pink coloring appeared at once. Then the filter was taken out of the holder and was placed on clean filter paper (with the coloring upward) to dry. After a few seconds, the coloring was compared with the scale on the paper obtained by the analogous method for certain lead concentrations. The sensitivity of the method was 0.015 ug in the drop (0.05 ml). For more reliable results, it is better to make two parallel (in the worst case, successive) determinations. The duration of one determination is not more than seven minutes, if the air contains lead in more than the normal amount.

D-6398

Poletaev, M. I.
COLORIMETRIC DETERMINATION OF SMALL AMOUNTS OF INDOLE IN AIR. [Kolorimetricheskoe opredelenic malykh kolichestv indola v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(10):76-77, Oct. 1965.

A colorimetric method for the determination of small quantities of indole is described. This method makes it possible to determine 0.0005 mg indole in the colorimetric volume.

D-6900

Chizhikov, V. A.
FUNCTIONAL EEG IN STUDIES OF THE EFFECT OF IMPERCEPTIBLE CONCENTRATIONS OF DANGEROUS POLLUTANTS. [K metodike funktsional'noi elektroentsefalografii pri izuchenii deistviya neoshchutimykh kontsentratsii vrednykh veshchestv na organizm cheloveka.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(10):119-122, Oct. 1965.

Electroencephalography as a means of investigating the effects of imperceptible concentrations of dangerous air pollutants is discussed. In Semenenko's variant of the method of functional electroencephalography (as applied to hygienic investigations) the modification index is a more adequate parameter than the summed amplitude of modified rhythm. The variation in the modification index is directly related to the strength of the effect of the investigated factor. The adoption of the modification index as the EEG parameter in this variant renders the method easier and more convenient. This method was applied to studies of the short term effect of small concentrations of toluene diisocyanate on the human body.

D-6902

Gorskaya, R. V.
A NEW PHOTOCOLORIMETRIC METHOD FOR THE DETERMINATION OF NAPHTHALENE IN AIR. [Novyi fotokolorimetricheskii metod opredeleniya maftalina v vozdukhe.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(11):243-244, Nov. 1965. 2 refs.

A photocolorimetric method for routine analysis of naphthalene is described. The method was tested under industrial conditions by determining the naphthalene in the air of the naphthalene shop of the Rutchenkovskii coke-chemical plant. Interference by phenols was prevented by trapping them first in an absorber containing 0.1 N alkali which was placed in front of the absorber for the naphthalene. The determination was carried out by two methods, with a nitrating mixture and with alloxantin. There was good agreement between the results.

D-6903

Pinigina, I. A.
THE SEPARATION AND DETERMINATION OF ALIPHATIC ALCOHOLS IN AIR BY PAPER CHROMATOGRAPHY. [Razdelenie i kolichestvennoe opredelenie alifaticheskikh spirtov v vozdukhe s pomoshch'yu khromatografii na bumage.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(11):244-249, Nov. 1965. 5 refs.

Separate determination of aliphatic alcohols (C_1-C_{10}) that simultaneously pollute the air in factories manufacturing synthetic alcohols was accomplished by paper chromatography. Volatile compounds can be determined by paper chromatography after their conversion to nonvolatile compounds. The alcohols are converted to the benzoates. The derivatives of alcohols C_1-C_6 arranged themselves on the chromatogram in the order of increasing number of carbon atoms. The derivatives of alcohols C_7-C_{10} arranged themselves on the chromotogram in the descending order of the number of their carbon atoms. The alcohols can be quantitatively determined by chromatographic separation, by means of the intensity of the color of the spots formed by their eluates. In the case of alcohols C_1-C_6, the color is eluted and the optical density of the elute measured with an SF-4 spectrophotometer or a photocolorimeter. Quantitative determination of the alcohols C_7-C_{10} was performed visually by comparing the color intensities of the sample spots with those of reference spots made with standard solutions.

D-6906

Parsadanyan, G. A.
INSTRUMENT FOR RAPID DETERMINATION OF HEALTH HAZARDS IN AIR USING TEST PAPER. [Pribor dlya bystrogo opredeleniya vrednykh primesei v vozdukhe s

primeniem reaktivnoi bumagi.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(12):385-386, Dec. 1965. 2 refs.

An instrument used to make the filter paper method more convenient for the determination of toxic substances in factories is described. The instrument consists of a body, a slide, a scale, nozzles, a three-way valve, and 50-ml syringe. There is also a cutter for cutting out circular portions of test paper. The air is drawn in through the syringe, and the resulting color is determined colorimetrically based on the artificial or natural standard scale which is attached to the slide. The instrument was used successfully under industrial conditions and is recommended for practical public health work.

D-6908

Gorskaya, R. V.
DETERMINATION OF PYRIDINE IN AIR. [K voprosu ob opredelenii piridina v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(12):93-96, Dec. 1965. 5 refs.

The determination of pyridine in factory air was accomplished by the reaction of pyridine with cyanogen chloride and barbituric acid. The method was tested under industrial conditions to determine pyridine concentrations in the air of the pyridine shop of a coking-chemical plant. Parallel determinations were made by the gas laboratory of the plant using cyanogen bromide and aniline. A comparison of the results shows that the determination of pyridine with cyanogen chloride and barbituric acid makes quantitative results possible, while the method used by the laboratory does not. This method also eliminates work with highly toxic reagents, is convenient for routine analysis under industrial conditions, and possesses high sensitivity and accuracy.

D-7081

Spurny, K., M. Polydorova, and Z. Starcuk
ANALYTIC FILTERS OF ORGANIC MICROFIBERS AND THEIR USE IN DETERMINING THE CONCENTRATION OF AEROSOLS AND DUST. Pracovni Lekar., 14(8):369-375, Oct., 1962. 12 refs. Translated from Czech, Technical Library Research Service, 18p., 1963.

The filtration properties of Czechoslovak analytic filters made of organic microfibers are described. A total of 15 different kinds were examined, some of which were equal in quality to similar filters of foreign production. The screening properties of these Czechoslovak analytic filters made of organic microfibers, their clogging by industrial atomized aerosols and their applicability for determining the concentration of radioactive aerosols are described. Pressed filter materials made of synthetic microfibers (chlorinated PVC) prepared in Czechoslovakia were tested along with analytic filters made of synthetic fibers in Moscow, filters made in Germany and diaphragm-filters. The filters made of synthetic microfibers all contained fibers in the thickness ranging from d = 0.3 to 3.75 μ, porosity 75 to 97 percent, average distance between fibers around 40 μ, and total thickness of filter 300 to 2000 μ. Both American filters (Millipore Filter AA and SM) and Czechoslovak filters (Synthesia AUFS) were used as diaphragm-filters. The nature of clogging, filtering efficiency, and absorption of alpha-radiation were studied. Fine blast furnace dust was used for the study of clogging. The efficiency of the filters was measured by the retention method of blast furnace dust aerosols labeled by the decay products of radon. The penetration of aerosol particles into a filter and the absorption of alpha-radiation by a filter were studied with the use of natural radioactive aerosols, i.e., by atmospheric air, labeled by the decay products of radon.

D-7145

Lastochkin, P. N.
A NEW METHOD AND APPARATUS FOR THE DETERMINATION OF CARBON MONOXIDE IN THE AIR. Gigiena i Epidemiol., No. 1, p. 9-12, 1928. Translated from Russian by B. S. Levine, U.S.S.R Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 143-147, Jan. 1960.
CFSTI: TT 60-21049

The method and apparatus are based on the property of a mixture of metals known as hopcalite (MnO_2, CuO, CO_2O_3, and Ag_2O) to catalytically oxidize CO contained in the air to CO_2. The catalytic oxidation generates heat in proportion to the intensity of oxidation. The reaction heat can be measured with the aid of thermoelements or with sound or light waves of determinable intensities or by some other suitable thermolectric procedure. The results can then be interpreted in terms of equivalent CO concentration in the air. A portable apparatus designed for the determination of CO in the air of industrial premises by the hopcalite catalytic method is diagrammed. This method and apparatus have the following shortcomings: 1) difficulty of obtaining a sufficiently stable, hard and active hopcalite; 2) necessity for preparing a scale for each set-up and each lot of hopcalite; 3) necessity to replace used-up calcium chloride.

D-7146

Gronsberg, E. Sh.
DETERMINATION OF VINYL CHLORIDE IN THE AIR. Gigiena i Sanit., No 11, p. 43-44, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 150, Jan. 1960.
CFSTI: TT 60-21049

The procedure described is based on bromination in chloroform solution with a bromine solution in a 1:1 mixture of glacial acetic acid and chloroform. The method is sensitive to 0.10 mg of vinyl chloride per test. The absorption of vinyl chloride from air is accomplished by aspirating the tested air through chloroform kept at -10° to -15°, at the rate of 10 - 12 liters per hour. This method is specific in the presence of methanol and dichlorethane. Observing the additional steps and precautions indicated obviates the interference of ethylene and chlorine.

D-7147

Stepanovich, A.
DETERMINATION OF CARBON MONOXIDE IN AIR. Glasnik Higienskog Inst. (Beograd), 4(1-2):77-88, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 151-160, Jan. 1960.
CFSTI: TT 60-21049

The principle of the method described involves the reduction of palladium chloride to elementary palladium by carbon monoxide. The palladium is removed by filtration; the unused palladium chloride is treated with an excess of potassium iodide solution which develops a red color the intensity of which is proportional to the amount of unused $PdCl_2$. CO in the sample is determined from the difference between the original and remaining $PdCl_2$. Substances other than CO which react with palladium chloride and substances which interfere with the CO reaction must be removed from the air sample before it is analyzed. These substances consist chiefly of unsaturated hydrocarbons, hydrogen sulfide, sulfur dioxide and ammonia. They can be precipitated with bromine water and with concentrated hydroxide solution. In addition to describing the $PdCl_2$ method, MSA CO indicator paper was tested against known concentrations of carbon monoxide. Simultaneously, known concentrations of CO were checked by the palladium chloride method. Results obtained by the two methods are presented in Table 5. A method is also given for the preparation of $PdCl_2$ paper indicator strips to be used in the detection and estimation of carbon monoxide in air. It is concluded that the palladium chloride method can be used conveniently in the field for CO concentrations ranging between 0.001 - 0.05 percent, and is well adapted for the determination of concentrations usually found in industrial establishments. A field worker can be trained to collect and analyze 10 air samples a day; range of error is ± 4 percent.

D-7148

Turkel'taub, N. and D. N. Senderikhina
DETERMINATION OF CARBON MONOXIDE WITH THE AID OF A GAS ANALYZER. Informatsiono-Metodicheskie Materialy, Vol 5, p. 21, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 161-164, Jan. 1960.
CFSTI: TT 60-21049

Carbon monoxide is oxidized with the aid of a red-hot platinum wire spiral in a special apparatus which is illustrated and described. The resulting carbon dioxide is absorbed by a given volume of 0.005 or 0.01 N barium hydroxide. The quantity of carbon dioxide is determined by the difference in titrations against HCl before and after the air sample is passed through the oxidizing (combustion) chamber. The sensitivity and accuracy of the method was found to be 0.0014 mg.

D-7149

Mokhov, L. A. and A. V. Demidov
DETERMINATION OF CARBON MONOXIDE IN THE AIR BY MEANS OF AN INDICATOR TUBE. Lab. Delo, 3(1): 48-50, 1957. 1 ref. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 165-167, Jan. 1960.
CFSTI: TT 60-21049

The method described is based on the reducing property of CO; the reagents employed are stable, and the reaction-color develops in a short time. The principle of the method is the reduction of palladium sulfate by CO. Control tests established that palladium sulfate is reduced more rapidly than any other palladium salt. Ammonium sulfate, one of the components of the indicator, stabilizes it, and ammonium molybdate increases the sensitivity of the reagent. Silica gel is used as the indicator base. The final product is introduced into a glass indicator tube and the air aspirated through it in a given volume. The sensitivity of the method is 0.005 mg/l. Determination accuracy is ± 5 percent on the volume basis.

D-7150

Dzedzichek, V. P. and A. V. Demidov
APPARATUS FOR THE DETERMINATION OF CARBON MONOXIDE AND CARBON DIOXIDE IN THE AIR AND OF GASEOUS COMPONENTS OF LIQUID FUEL. Lab. Delo, 3(4):46-51, 1957. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 168-177, Jan. 1960
CFSTI: TT 60-21049

The principle of the method described is the same as that of the combustion methods currently in use. The carbon monoxide or the hydrocarbons contained in the air are oxidized to carbon dioxide in a combustion chamber with the aid of an electrically heated coil. The carbon dioxide is then passed through a coil condenser (absorber) which contains a known volume of a known solution of barium hydroxide, and the excess of the latter determined by titration with a standardized solution of HCl, and the results expressed in mg of CO or of hydrocarbons, as the case may be, per liter of air. The apparatus consists of four main sections: the purifying section, the distributor, the combustion chamber, and the absorber. The apparatus and technique are described in detail.

D-7151

Polezhaev, N. G.
DETERMINATION OF FREE SILICON DIOXIDE IN THE PRESENCE OF SILICATES IN INDUSTRIAL EMISSIONS AND IN ATMOSPHERIC DUST. Gigiena i Sanit., 22(11):91-94, 1957. Translated from Russian by B. S. Levine, U. S. S. R., Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 178-183, Jan. 1960.
CFSTI: TT 60-21049

In this method the SiO_2 is destroyed and removed from the sample leaving the silicates intact. The method is based on fusing free SiO_2 and the silicates with $KHCO_3$ or $NaHCO_3$ in the presence of chlorides. In the process of fusion the free SiO_2 becomes converted into alkaline salts of silicic acid while the silicic acid of the silicates is retained by the silicate molecule enriched by the alkaline flux. Quantitative determination of the silicic acid is done colorimetrically by the yellow color intensity of the formed silicamolybdic complex. The method is sensitive to 0.2 mg of SiO_2 in 50 ml.

D-7152

Berezina, T. A.
COLORIMETRIC DETERMINATION OF IODINE IN THE AIR. Gigiena i Sanit., 22(12):33-90, 1957. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 184-186. Jan. 1960.
CFSTI: TT 60-21049

A study was made of the present methods used in the determination of iodine in the air which are based on the direct titration of the iodine by the subjective colorimetric determination. All such methods were found to have some basic shortcomings. Experiments were undertaken to define the possibility of determining iodine in air electrocolorimetrically (electrophotometrically). Since yellow tinted iodine solutions absorb blue rays of 440 mμ length, the blue light filter should be used. The illumination of iodine solution with this monochromatic light (blue) creates a set of conditions under which the rays of light are absorbed by the solution in a definitive ratio to the concentration of the iodine. By this method a single determination and calculation of the results can be made in 2 - 3 minutes. It requires no previously prepared titration solution for each determination, since the nomographic scales need be prepared only once and can be used for all future determinations. The air samples are collected into three successive absorbers of the Petri type, each of the first two containing 20 ml of the 1 percent KI solution and the third containing 10 ml of the absorber solution. The air is aspirated at the rate of 60/hour. The air is passed through an electric oven which vaporizes the iodine. The contents of the three absorbers are poured into the left colorimetric container, the one on the right side containing 50 ml of the original KI absorber solution. The electric current is switched on and the galvanometric needle adjusted to the zero point with the aid of the current flowmeter. Meter readings are then made and converted into mg/liter of air. The method enables the determination of 0.001 mg of iodine per ml of solution.

D-7153

Bronsberg, E. Sh.
CHROMATOGRAPHIC SEPARATION OF BENZENE AND ISOPROPYLBENZENE AND OF BENZENE AND CHLOROBENZYL IN AIR ANALYSIS. Gigiena i Sanit., 23(1):77-81. 1958. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 187-191. Jan. 1960.
CFSTI: TT 60-21049

The method studied consisted of a combination of thermal desorption and chromatographic analysis. Sets of conditions developed for the chromatographic partitioning of vapors of benzene, isopropylbenzene and chlorobenzyl present in the air of industrial manufacturing premises. The partitioning was accomplished at the time of the sample taking when the air was aspirated through the system which consisted of a V-shaped tube containing grade ASK silica gel and of two absorbers containing 2 ml of a nitro-mixture. The benzene is absorbed by the nitro-mixture, the second component remaining adsorbed by the silica gel. Colorimetric methods are described for the determination of the isopropylbenzene and the chlorobenzyl in the presence of benzene.

D-7154

Nemirovskii, N. L. and G. I. Meerovich
COLORIMETRIC METHOD FOR THE QUANTITATIVE DETERMINATION OF METHYL ESTER OF METHACRYLIC ACID IN THE AIR OF WORK SHOPS. Gigiena i Sanit., 23(2):83-85, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 192-201, Jan. 1960.
CFSTI: TT 60-21049

The method which is presented is based on the property of this type of unsaturated organic ester to unite with Br. The air sample is collected with the aid of ethyl alcohol which readily absorbs the methyl ester of the methacrylic acid. To the alcoholic absorber solution aqueous solutions of KBr, $KBrO_3$ and of HCl are added in quantities just enough to liberate Br in slight excess over that required, the Br excess colors the solution. The greater the ester concentration in the alcoholic absorber the more free Br will be consumed and, hence, the lighter will be the Br coloring the solution. By adding a known quantity of free Br and by comparing the colored solution with known color standards the quantity of the Br combined with the ester can be determined, and the quantity of the ester in the absorbed air sample computed. The colorimetric determination can be adjusted to have standard colored series represent directly the quantity of the ester contained in the alcohol absorbed air sample, without having to resort to additional computation. Methyl ester quantities as low as 0.01 mg/ml can be determined accurately by this method.

D-7155

Gladchikova, Yu. N. and N. I. Shumarina
CHROMOTROPIC ACID METHOD FOR THE DETERMINATION OF FORMALDEHYDE IN AIR. Gigiena i Sanit., 23(4):83-84. 1958. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 202-205, Jan. 1960.
CFSTI: TT 60-21049

A procedure based on the reaction taking place between chromotropic acid (1,8-dioxy-3,6-disulfonaphthalic acid) and formaldehyde in the presence of H_2SO_4 is described. This method was found to be superior to the fuchsin-sulfurous method. It is more specific even in the presence of many organic compounds and its standard color scale is more permanent.

D-7156

Senderikhina, D. P.
DETERMINATION OF PARAFFIN AND CERESIN AEROSOLS IN THE AIR OF INDUSTRIAL PLANTS. Gigiena i Sanit., 23(8):77-78. 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 206-207. Jan. 1960.
CFSTI: TT 60-21049

For quantitative determination of petroleum paraffin vapor its differential characteristics of dissolving readily in ether and with difficulty in ethanol were utilized. The ethanol is added to the ether-dissolved petroleum paraffin and cooled to 0° which causes the paraffin to separate from solution as an emulsion whose turbidity varies directly with the quantity of the dissolved paraffin. The standard solution to be used in the turbimetric comparator is prepared from a weighed amount of petroleum paraffin in ethyl ether, usually 1 mg per ml. Quantitative analysis of synthetic cerecin is done gravimetrically by aspirating through a glass filter No. 2 at the rate of 0.2 lit./min using ether as the absorber. The absorbed cerecin is removed from the glass filter plate by dissolving it in hot gasoline; the latter is driven off by evaporation in a preweighed porcelain dish over a waterbath. After the gasoline has been evaporated the dish is cooled for 20 - 30 minutes in a desiccator and weighed on an analytical balance.

D-7157

Grigorova, L. P.
DETERMINATION OF LEAD IN THE AIR BY AMPEROMETRIC TITRATION. Gigiena i Sanit., 22(11):94-95, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 208-210, Jan. 1960.
CFSTI: TT 60-21049

A procedure for the quantitative analysis of lead based on the amperometric titration of hydrochloric acid solutions of lead with ammonium molybdate is described. This method enables the determination of 10×10^{-6} mg of lead in 10 ml. A mercury capillary electrode was used and the comparing electrode consisted of a calomel-saturated semi-element. Recording of the diffusion current was accomplished by a reflection mirror galvanometer of the GZP-47 type. A solution of 0.1 N KNO_3 was used as the medium. Experiments were made at potential 1 b in an atmosphere in which oxygen was replaced by hydrogen. The lead compounds present in the air were retained by paper filters. The air was aspirated through the filters at the rate of 10 - 15 l/min. Depending upon the expected aerosol concentration in the air, between 50 - 300 liters of the air were sucked through. Soluble and insoluble lead are determined in one sample, and another sample is used for the determination of total lead.

D-7264

Juda, J. and K. Budzinski
ATMOSPHERIC POLLUTION. [Zanieczyszczenia Atmosfery.] Warsaw, Wydawnictwa Naukowo-Techniczne, 1961, 256p. 29 refs. Translated from Polish. Joint Publications Research Service, Washington, D. C., 261p., March 31, 1963.
CFSTI: 63-21460

Information about the sources, dispersion and investigation of atmospheric pollutants is reported. Results of studies from foreign sources are given, and an attempt is made to analyze these data in the light of conditions prevailing in Poland. The work is intended for engineers who plan industrial plants and supervise the operation of machinery and industrial installations, as well as for the safety and work hygiene service employees. Subjects discussed are: (I) Systematic Classification of Atmospheric Pollutants; (II) Sources of Atmospheric Pollutants; (III) Damage Caused by Atmospheric Pollution; (IV) Aerosol Mechanics; (V) The Influence of Meteorological Conditions on the Dispersion of Pollutants; (VI) Dispersion of Pollutants in the Atmosphere; (VII) Methods of Measuring Atmospheric Pollution; (VIII) Determination of Pollutant Emission; (IX) Estimation of Dustfall; (X) Determination of Particulate Matter Concentration; and (XI) Determination of Gaseous Air Pollutants.

D-7283

Erenburg, G. S., M. N. Krasnogorskaya, I. I. Lifshits, and E. T. Lykhina
THE GRAVIMETRIC AND COUNT METHODS FOR THE DETERMINATION OF DUST CONCENTRATION IN INDUSTRIAL ESTABLISHMENTS. Gigiena i Sanit., No. 7, p. 3-5, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 1-3, March 1960.
CFSTI: TT 60-21188

A comparison is made of the gravimetric and count methods for the determination of dust concentration. The sanitary-hygienic significance of extreme high dispersion and ultramicroscopic particles has been generally recognized; it is equally well recognized that it is practically impossible to determine them by the gravimetric method. On the other hand, recent developments in the field of ultramicroscopy made it possible to determine not only the presence of such particles, but their relative numbers and their rate of sedimentation, two factors which are of prime importance in determining the health hazard of a given air dust concentration. This is the reason why the count methods of evaluation of dust concentrations became widely used. The gravimetric method as a criterion for the evaluation of dust concentration is adequate and should be employed where the dust concentration is related principally to the coarser fractions of dust, as in the efficiency evaluation of dust separation measures, particularly as applied to low dispersion dust. However, with reference to finer fractions of dust the count method is superior. The gravimetric method can be effectively used in the evaluation of air polluted with toxic dust, in combination with the count methods. The gravimetric method will predominate as long as it forms the basis for existing regulations. Recent scientific attainments, the results of koniometric investigations and the demands of industry make it imperative that new standards be established based on the results of dust particle counts and their degree of dispersion.

D-7284

Khrustaleva, V. A. and N. G. Shalya
MERCURY POLLUTION OF INDUSTRIAL PREMISES IN WORK INVOLVING MERCURIC CHLORIDE. Gigiena i Sanit., No. 9, p. 22-25, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 4-7, March 1960.
CFSTI: TT 60-21188

An investigation was made into the source of mercury in the atmosphere inside a dry cell plant. The method of $HgCl_2$ absorption by a NaCl solution was used in making separate determinations of the simultaneous presence of mercuric chloride and of mercury fumes. Mercury was determined colorimetrically. The results indicated that air pollution in the shops was caused almost entirely by Hg fumes and that the concentration of the $HgCl_2$ fumes was negligible. High concentrations of both substances were found in scrapings from the walls and floor. At this point it became certain that mercury was the source of pollution of the working area; attempts were then made to establish the cause of $HgCl_2$ reduction to Hg. The reducing action of the individual ingredients of the electrolyte and of the flour thickener was also investigated. Since calcium chloride, ammonium chloride and zinc chloride did not reduce mercuric chloride, it was assumed that metallic zinc, as an impurity of the zinc chloride, might have been responsible for imparting this property to the electrolyte. However, results of the analyses did not substantiate this assumption. An attempt was then made to determine mercury in the final electrolyte which contained the flour thickener. Mercury was found in amounts of 0.099 - 0.2 mg per 100 g of final electrolyte. On the basis of information found in the literature concerning the property of organic substances to reduce $HgCl_2$ experiments were set up to determine the reducing properties of the flour. Subsequent colorimetric determinations of mercury in the electrolyte yielded positive results. To improve the sanitary-hygienic conditions in the shops, it was suggested that mercuric chloride, which is not an electrolyte, be replaced by another less toxic substance, and that substitutes be found for the flour thickener.

D-7285

Khrustaleva, V. A.
DIFFERENTIAL DETERMINATION OF ORGANIC AND INORGANIC LEAD IN THE AIR OF GARAGES. Gigiena i Sanit., No. 9, p. 43-49, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 3-10, March 1960.
CFSTI: TT 60-21188

Air samples for the determination of inorganic compounds should be collected by aspirating 300 - 500 l of air through absorbent cotton at a rate of 10 l/min. With reference to tetraethyl lead it may be stated that, owing to the presence of carbon monoxide and vapors of hydrocarbons in the air, and the nonspecificity of the method, its determination in the form of intact molecules is not feasible. It is necessary first to destroy the molecules and to proceed with the determination of free lead. For this purpose tetraethyl lead is absorbed from the air into alcohol at a rate not exceeding 1 l/min, i.e., 60 l per hour; at a higher rate evaporation of the alcohol-dissolved tetraethyl lead will take place. By the method used in this study metallic lead determinations could be made reliably with 0.002 - 0.005 mg as the lower limit. For the collection of tetraethyl lead air samples the use of conventional equipment is proposed, such as a suction dust collector, a high velocity flowmeter, corrugated tubes as adapters for cotton filters to retain metallic lead, and Petri tubes containing 10 ml of alcohol for the absorption of the tetraethyl lead. By the proposed method of air sampling it was possible to aspirate within one hour and a half up to 1 m^3 of air and to accumulate a quantity of tetraethyl lead sufficient for a precise determination.

D-7288

Vaskevich, D. N. and T. I. Sergeeva
A RAPID METHOD FOR THE DETERMINATION OF SMALL QUANTITIES OF ALPHA-NATHTHYLAMINE IN THE AIR OF INDUSTRIAL AREAS. Gigiena i Sanit., No. 3, p. 41-45, 1956. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 31-36, March 1960.
CFSTI: TT 60-21188

A rapid method was developed for the determination of small amounts of a-napthylamine, which is based on the formation of a colored compound resulting from the reaction taking place between a-napthylamine and diazoaminobenzol in acetic acid medium. The sensitivity of the method is 0.3 μg/3 ml with a concentration limit of 1 x 10^7. The color of the standard sets keeps for several months and can be used instead of artificial sets. The presence in the air of a threefold excess of B-napthylamine did not interfere with the correct quantitative determination of a-napthylamine. A rapid method was developed for the collection of air samples with the aid of a new MIOT-2 absorber; the method is based on the formation of flakes by the absorbed particles and the dissolution of the flakes and fumes of a-naphthylamine by a solvent applied to the large cotton surface area. Using the method described, the quantitative determination of a-naphthylamine in the air can be made in 10 to 15 minutes. (Authors' summary)

D-7293

Gusarov, I. I. and V. K. Lyapidevskii
A METHOD FOR THE DETERMINATION OF NATURAL RADIOACTIVITY OF AIR BASED ON RADON FISSION PRODUCTS. Gigiena i Sanit., 23(10):10-16, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 87-95, March 1960.
CFSTI: TT 60-21188

Radioactive aerosols in quantity sufficient for determination were collected by the method of air aspiration. One to 3 cubic meters of air was aspirated at a rate of 70 - 90 l/min through a 6.6 cm^2 filter in a Zeitz holder. Results of tests showed that filter types BF and FPP-5 had a negligibly low coefficient of passing-through, an autoabsorption in the filter body within the limits of 10 - 15 percent and a sufficiently high filtration rate. In the case of filter type FPP-15 the total error due to passing-through and to autoabsorption ranged up to 30 percent. In utilizing membrane filters the error caused by the passing-through and self-absorption could be ignored, but their filtration rates were 1.4 - 1.5 times below those of filters BF and FPP-5. Filters of the FPP-25, FPP-15 type and all membrane filters carried an electric charge which had no effect on the course of filtration within the range of 3 - 12 l/min per cm^2. Calculation methods, made possible the determination of complete isotopic content of short-life products of radon decomposition in the air. The diffusion chamber described in this study can be utilized in practical hygienic-sanitary dosimetric determinations: a) in determining low a-activity samples under laboratory conditions, in the standardization of a-active preparations; in checking the effectiveness of pulsed a-counters and other a-particle counters; b) in practical evaluation of small dimension portable devices; c) in measuring natural radioactivity of atmospheric air. (Authors' summary, modified)

D-7295

Zykova, A. S., V. A. Schastnyi, and G. P. Efremova
DETERMINATION OF NATURAL RADIOACTIVE AEROSOLS IN ATMOSPHERIC AIR. Gigiena i Sanit., 23(10):62-64, 1958. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 102-106, March 1960.
CFSTI: TT 60-21188

Investigations were made of concentrations of natural radioactive aerosols at distances of 125, 100, 90, and 45 km from Moscow along a radius extending in a southwesterly direction. Air samples were collected by the aspiration method using FPP-15 type filters. Aspirators were installed 1.5 m above the ground and the filters had a surface of 12.5 cm^2. The time needed for the collection of the sample varied between 10 - 20 and up to 30 - 60 minutes. The rate of air aspiration varied from 8 to 14.5 $l/min/cm^2$. Samples were brought to the radiometric laboratory 10 - 15 minutes after the termination of sample collection; sixty-eight samples were collected. Beta-activity in the filter was determined with the aid of an MST-17 counter; alpha-activity determinations were made using a scintillation (impulse) attachment. The results indicated that radioactive aerosols collected on filters decomposed rapidly. Therefore, decomposition curves were plotted and half-life periods determined for several samples. Decomposition curves showed that the average half-life period of beta and alpha-active samples amounted to 35 minutes. Calculations were made estimating the reduced number of filter impulses per minute to the end of sample collecting. Final results indicate that specific concentrations of natural radioactive aerosols fluctuated within a wide range: for beta-activity from 0.5 x 10^{-13} to 11 x 10^{-13} C/l; for alpha-activity from 0.2 x 10^{-13} to 11 x 10^{-13} C/l.

D-7296

Belousov, A. Z., Yu. V. Novikov, V. F. Oreshko, and B. I. Polivoda
THE DETERMINATION OF NATURAL AEROSOL RADIOACTIVITY OF ATMOSPHERIC AIR. Gigiena i Sanit., 23(10):64-69, 1958. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 106-115, March 1960.
CFSTI: TT 60-21188

A method for the determination of natural radioactivity of the atmosphere caused by short-lived isotopes was evaluated. The aspiration method was used for the collection of air samples. The sample collecting apparatus consisted of a special filter holder, flowmeter for the standardization of the rate of air aspiration and a Gubkin pump. Two samples were collected simultaneously: one for beta-active and one for alpha-active aerosol determination. Cloth filter FPP-15 was used because its pressure drop at the air flow rate of 0.05 l/min per 1 cm^2 was 1.5 ± 0.2 mm of water. For the determination of the volume of air to to be aspirated through a filter to obtain the required precision of measurements, a series of tests were carried out to establish the intensity of the filter activity after the aspiration of different volumes of air at a constant aspiration rate. After each test the filter activity was determined with an end-window counter in a lead housing. For the determination of optimal air aspiration rate through the filter three sets of tests were made in which duplicate samples were collected simultaneously. The coefficient of radioactive aerosol passing-through of the filter at the aspiration rate used was also studied. Calculations necessary for the determination are presented. The method under discussion was later used over an extended period of time in making regular determinations of the natural aerosol radioactivity of the ambient air. The data obtained indicated that with the aid of this method it was possible to obtain satisfactory results in determining the content of short-lived aerosols in the atmosphere up to the order of 10^{-14} C/l.

D-7297

Tomson, N. M.
THE DETERMINATION OF RADIOACTIVITY IN ATMOSPHERIC DUST. Gigiena i Sanit., 23(10):69-70, 1958. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 115-118, March 1960.
CFSTI: TT 60-21188

Methods were compared for obtaining samples to be used in the determination of radioactivity in atmospheric dust. The collection of air dust samples into jars over a 30-day period serves the purpose of preliminary information and requires only one day per month. Jars 15 cm in diameter and 20 cm high, made of stainless steel, duralumin or glass were used. For a more detailed study of settled dust radioactivity, samples were collected over a period of 24 hours into 50 x 50 cm glass dishes 10 cm high. To enhance the trapping of the radioactive substances, nitric acid solution of carrier-salts was poured into the dish: barium was used for binding strontium, sodium for binding rubidium and cesium, lanthanum for binding rare earths and iron as a universal carrier. The dish method required considerable time and labor; therefore, it was substituted by the more convenient method of sticky screens. In this method 40 x 40 cm sheets of paper were coated with a thin layer of vaseline or a sticky substance composed of equal parts of castor oil and rosin. After a 1 - 3 days exposure the sticky paper was folded, incinerated and beta-activity of the ashes determined. For determination of total winter season activity of settled dust, snow samples were collected from undisturbed snow surfaces. Dust samples were also collected by the aspiration method using synthetic fiber filters of FPP-15 model. The aspiration method served mainly for the determination of short-lived alpha-activity. For the determination of long-lived alpha-activity the air had to be aspirated for many hours and even days to accumulate a quantity sufficient for analysis. Results of the air dust radioactivity determinations showed that in order to obtain as near a complete picture as possible it was necessary to use a complex of sample collecting methods. Results obtained by one method could not be converted into data obtained by other methods due to different sample collection conditions. Therefore, the results of activity determinations made by different methods had to be examined concomitantly on a parallel basis.

D-7298

Dikun, P. P.
THE DETERMINATION OF 3,4-BENZPYRENE IN PRODUCTS OCCURRING IN THE MANUFACTURE OF SYNTHETIC LIQUID FUEL. Vop. Onkol., Vol. 4, p. 289-291, 1958. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 122-125, March 1960.
CFSTI: TT 60-21188

The results of fluorescent-spectral analyses of a series of the primary, intermediate, and final products in the U.S.S.R. manufacture of synthetic liquid fuels by the hydrogenation method are presented. The analytical procedure was as follows: One gram of the test material was dissolved in 15 - 20 ml of petrolic ether. Highly viscous products, such as coal paste, petroleum residue, etc., not easily soluble in petrolic ether were first dissolved in 2 - 3 ml of benzene, and then diluted with a specified volume of petrolic ether, which was accompanied by the formation of a heavy precipitate, the latter was removed with the aid of a Buchner funnel filter. The filtrate was passed through a column of aluminum oxide; the adsorbed substances were eluted with a mixture of petrolic ether and benzene. The passing of the substances through the column was followed with the aid of a luminescent light. The fluorescent spectra of the chromatographically partitioned fractions were photographed for permanent recording of the presence of carcinogenic substances. From the concentration of 3,4-benzpyrene found in the partitioned fraction the total content of 3,4-benzpyrene in the product was calculated. The method employed was designed for the detection of 3,4-benzpyrene as the representative carcinogenic factor of polynuclear aromatic hydrocarbons. Results of investigations by this method fully agree with theoretical assumptions that 3,4-benzpyrene and probably the other carcinogenic substances of this type were not newly formed during the production of synthetic liquid fuel, but were destroyed, if originally contained in the primary material. It must be borne in mind that these conclusions apply only to the 3,4-benzpyrene types of carcinogenic substances; the results of this investigation do not exclude the possibility of the formation of carcinogenic substances of different chemical structures.

D-7476

Tupeeva, R. B.
THE DETERMINATION OF THIOGLYCOLIC ACID IN AIR. [Methody opredeleniya tioglikolevoi kisloty v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(3):381-383, March 1967. 3 refs.
CFSTI: TT 67-51409/1

A method based on the reduction of yellow heteropolic acids to form blue-colored products as well as on the color reaction with cuprous salts is described. The experiments showed a linear relationship between the optical density and the thioglycolic acid concentration. The determinable minimum was 0.005 mg. The stability of color with time was tested and found to be stable for at least 24 hours. A series of experiments were carried out to determine the optimum conditions for the determination of thioglycolic acid from its color reaction with cuprous salts. The standard solution of thioglycolic acid was prepared by dissolving an exactly-weighed sample in 20 percent acetic acid. In the determination of thioglycolic acid in air, a few milliliters of thioglycolic acid were placed in a bubbler and air was drawn at a rate of 0.2 l/min.

D-7477

Salyamon, G. S.
THE DETERMINATION OF POLYETHYLENEPOLYAMINES AND PRIMARY ALKYLAMINES IN AIR. [Opredelenie polietilenpoliaminov i pervichnykh alkilaminov v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(3):384-390, March 1967. 12 refs.
CFSTI: TT 67-51409/1

Experiments were performed with pure samples of ethylenediamine (EDA), diethylenetriamine (DETA) and triethylenetetramine (TETA), as well as with different fractions of commercial polyethylenepolyamines (PEPA) produced by vacuum dephlegmation. The DETA was obtained by the fractional distillation of PEPA, while the TETA was synthesized from EDA and dibromoethane and purified. The purity and percentage concentration of the preparations were determined by potentiometric titration with 0.1 N H_2SO_4 in alcohol-aqueous or aqueous solutions. Tests of dinitrochlorobenzene in aqueous-chloroform medium and in ethanol solution showed that all the investigated samples produced some color with this reagent. Using methods of quantitative analysis for the determination of the vapors and aerosols of PEPA and primary aliphatic amines in the air, it was established that all the PEPA investigated became liberated into the air when air was drawn over them or when they were allowed to undergo free evaporation. When amines were allowed to evaporate freely into air containing up to 1 percent CO_2, they were mainly present in the air in the form of vapors rather than aerosols.

D-7566

Suvorov, S. V.
DETERMINATION OF THE AMOUNT OF RHENIUM OXIDES IN CONDENSATION AEROSOLS. [K voprosu o metodike opreledeniya okislov reniya iz aerosolei kondensatsii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7):80-81, July 1965. 3 refs.
CFSTI: TT 66-51033/3

Experiments on animals demonstrated the possible harmful effects of rhenium compounds on the different systems of the body. A method was devised for estimating small amounts of rhenium and which would be suitable for practical sanitary-chemical analyses of air. The method of analysis is as follows. The filter used for obtaining the sample is transferrrd to a flask containing 10 ml distilled water, the flask is vigorously shaken, and the analysis is started after half an hour. The solution now contains particles of condensation aerosols. For analysis, 1 ml of the sample is transferred to a colorimetric test tube, and the volume brought up to 5 ml with 2 N HCl. Simultaneously, an aqueous solution of potassium perrhenate, containing 0.2 ml Re per 1 ml, is used for the preparation of a standard scale containing 0.01 to 0.1 mg Re, at intervals of 0.01 mg. One ml portions of distilled water are added to all the test tubes of the scale and the volume is brought up to the mark with 5 ml of 2 N HCl. Then 1 ml portions of a 1 percent alcohol solution of dimethylglyoxime and 2 ml portions of a 2 percent solution of stannous chloride (prepared by dissolving stannic chloride in concentrated hydrochloric acid) are added to each test tube of the scale and to the sample. The solution is shaken and the colors are compared after half an hour. To sample rhenium from the air, the latter should be drawn through a filter paper at the rate of 10 l/min. To maintain similar sampling conditions, the filter paper must be one of the following grades: (1) white band, (2) blue band, or (3) red band. The filter paper of these grades readily captures dust and metal smokes (up to 99.4 - 99.8 percent, according to Gernet). A sample for analysis is obtained by drawing 100 - 200 l of air through the filter, the amount depending on the expected concentration of the substance.

D-7567

Razumov, V. A. and T. K. Aidarov
INDIRECT SPECTROPHOTOMETRIC DETERMINATION OF MERCURY VAPOR CONCENTRATIONS IN THE AIR OF WORK PREMISES. [Kosvennyi spektrofotometricheskii metod opredeleniya parov rtuti v vozdukhe rabochikh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7):81-83, July 1965.
CFSTI: TT 66-51033/3

The method proposed states that the sample of air for analysis should be taken by drawing 100 l air, at the rate of 5 l/min, into an absorbing solution consisting of 5 ml 0.1 N potassium permanganate and 5 ml 10 percent sulfuric acid. The absorbing solution is decanted into a separating funnel and 5 percent solution of oxalic acid is added in small amounts to destroy the permanganate until the solution is completely decolorized. The volume is then brought up to 20 ml with twice-distilled water prepared in a quartz apparatus, 5 ml of 6 N acetic acid are added, the liquid is shaken and an addition is made of 10 ml dithizone (C. P.) solution in carbon tetrachloride or chloroform, with a concentration of 1 mg/100 ml. The mixture is vigorously shaken for 15 to 20 sec, 10 ml carbon tetrachloride are added, and the liquid is again shaken. The colored extract is then decanted into a cell. Mercuric chloride (0.0135 g) is dissolved in water in a 100 ml volumetric flask (the solution can be used for 6 months). The working standard solution, with a mercury concentration of 1 microgram/ml, is prepared by diluting the basic solution with twice-distilled water to 100 times the original volume. This solution is unstable, and should not be stored for long. Measurements are made with an SF-4 spectrophotometer.

D-7568

Bulanova, I. D. and A. M. Vorob'ev
DETERMINATION OF PROTACTINIUM-233 CONCENTRATION IN AIR. [Opredelenie protaktiniya-233 v vozdushnoi srede.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(7):83-85, July 1965. 3 refs.
CFSTI: TT 66-51033/3

Samples of air for the determination of protactinium concentrations were obtained by drawing air at the rate of 50 l/min through filters of Petryanov's fabric 50 mm in diameter, fixed in special Plexiglas filter holders. After sampling, the filter was transferred to a porcelain dish or crucible and incinerated in a muffle at 500 - 600 degrees for 1 hour. When the crucible had cooled, the residue was twice treated with 0.5 ml portions of a mixture of 8 M HCl + 0.5 M HF. The liquid from the crucible was transferred to a test tube and 1 ml methyl isobutyl ketone was added. The test tube was shaken for 1 or 2 minutes. The organic solution was discarded, and an addition was made of 2 ml methyl isobutyl ketone and 150 ml solid aluminum chloride ($AlCl_3 . 6H_2O$). The liquid was shaken for 2 minutes, and after the separation of layers, the organic layer was transferred to another test tube, while the aqueous layer was discarded. The organic layer containing the protactinium was washed with 2 ml 8 M HCl. The washed organic layer was transferred to a third test tube, and the protactinium was reextracted into the aqueous phase by a mixture of 8 M HCl + 0.5 M HF. The preparation of radiochemically pure protactinium required two cycles. The yield of protactinium was 92 - 94 percent. The amount of protactinium in the sample was determined by taking aliquots either from the organic layer after washing, or the aqueous phase after reextraction, and applying them to steel targets, which are dried and counted with a BFL end-counter with an inlet window 1 to 2 mg/cm^2 thick. The absolute activity can be obtained by calculation or by comparison with a Pm^{147} standard.

D-7575

Manita, M. D. and G. Kh. Ripp
SPECTROPHOTOMETRIC DETERMINATION OF LOW ATMOSPHERIC CONCENTRATIONS IN THE PRESENCE OF OTHER PRODUCTS LIBERATED DURING THE MANUFACTURE OF SYNTHETIC RUBBER. [Spektrofotometricheskii metod opredeleniya malykh kontsentratsii divinila v atmosfernon vozdukhe v prisutstvii drugikh produktov proizvodstva sinteticheskogo kauchuka.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(8):231-234, Aug. 1965. 1 ref.
CFSTI: TT 66-51033/3

The spectrophotometric method for the determination of DV (1,3 butadiene) was tested under field conditions in the atmosphere around the factory manufacturing synthetic rubber SK. The maximum DV concentrations were 6.12 to 0.5 mg/m^3 at distances of 50 to 2000 m, respectively, from the source of pollution in the summer season, and 3.8 to 0.1 mg/m^3 at the same distances in the autumn-winter season. Thus, the spectrophotometric determination of DV in the atmosphere in the presence of alpha-methylstyrene, isopropylbenzene, butane, and butylenes is based on measurements of the optical density of the isooctane solution of the mixture of wave-lengths 224 and 245 millimicron in quartz cell with 1 = 1 cm with an SF-4 spectrophotometer. DV concentration in the solution is calculated from the provided formula. The sensitivity is 0.125 microgram/ml. the accuracy is within plus or minus 2.6 percent.

D-7578

Krylova, N. A.
THE SPECTROPHOTOMETRIC DETERMINATION OF DIMETHYLPHENYLCARBINOL AND DIMETHYL-PHENYL-PHENYL-P-CRESOL IN AIR. [Spektrofotometricheskoe opredelenie dimethilfenilkarbinola i dimethilfenilparakrezola v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(9):375-379, Sept. 1965. 2 refs.
CFSTI: TT 66-51033/3

The spectral characteristic of DMPC (dimethylphenylcarbinol) in the ultraviolet region was studied. The solvent was ethanol. The instrument was an FE-4 spectrophotometer. The calibration graph was checked against several synthetic samples prepared in the laboratory. The mean error lay within plus or minus 3.6 percent Consequently, the calibration graph can be used for the determination of DMPpC (dimethylphenyl-p-cresol) in solutions. The sensitivity is 0.5 microgram/ml. The degree of conformity of DMPpC solutions to Beer's Law was studied and a calibration graph in the region of 279-280 millimicrons was constructed. The sensitivity at lambda 279 millimicrons was 2 micrograms/ml. DMPC and DMPpC can best be absorbed by drawing air, at a rate of 0.5 l/min, through three Zaitsev absorption vessels connected in series, each of which is filled with 5 ml ethyl alcohol and cooled with ice. Up to 90 percent DMPC and CMPpC is retained by the first absorber, and up to 10 percent in the second. The next step was concerned with the possibility of determining DMPC and DMPpC separately when present together. This mixture was analyzed by means of a modification of Vierordt's method, in which one component absorbs light at a wavelength at which the other is not detected. At lambda = 225 millimicrons, DMPpC solutions have an intense absorption whereas DMPC solutions have an insignificant absorption up to a concentration of 10 micrograms/ml, without producing any appreciable deviations. At lambda = 210 millimicrons both substances absorb intensely. The effects of phenol and acetone on the determination of DMPC and DMPpC were verified. Phenol interferes with the determination of the substances in question because of its considerable light absorption in the region 210 - 225 millimicrons. Acetone hardly interferes with the determination because even solutions containing 10 μg/ml of acetone cause only a slight degree of deviation (of the order of 0.015 to 0.02) in the regions used in the determination.

D-7579

Hluchan, E., Ya. Mayer and E. Abel
ATMOSPHERIC POLLUTION BY FLUORINE COMPOUNDS IN THE NEIGHBORHOOD OF AN ALUMINUM PLANT. [Zagryaznenie atmosfery soedineniyami ftora v okrestnostyakh alyuminievogo zavoda.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(9):426-428, Sept. 1965.
CFSTI: TT 66-51033/3

The results of the determination of fluorine compounds in the atmosphere around an aluminum plant over a period of 6 years are given. The method used consisted of the titration of distilled samples with thorium nitrate, in the presence of the new metallochrome indicator Methylthymol Blue. Concentrations of fluorine compound in the atmosphere within a large radius of an aluminum plant varied from 0 to 1.15 mg/m^3. The fallout from the atmosphere of solid fluorine compounds in the vicinity of the plant amounted to 4300 kg/km^2 per year, which is almost 53 times the natural fallout of this substance over small populated areas. The area around the plant is excessively contaminated, with high fluorine concentrations in the soil, agricultural products, plants, animals, surface waters, and other elements of the environment.

D-7723

Wolf, Anneliese
AN IMPROVED METHOD USING THE BAHCO SEPARATOR (BAHCO MICROSCOPE SEPARATION). STAUB (English translation), 27(4):30-33, April 1967. 11 refs.
CFSTI: TT 67-51408/4

A special method for particle size analysis using the Bahco separator is described. The results obtained are almost identical with those obtained by the Gonell separator. As a result of the small amount of dust used, longer residence time of dust in the separation zone and of control under the microscope, this so-called Bahco microscope separation permits an improved separation of particles up to a range of 3-4 microns. (Author's summary)

D-7812

Clerc, J. T., R. Dohner, W. Sauter, and W. Simon
FULLY-AUTOMATIC APPARATUS FOR THE SIMULTANEOUS DETERMINATION OF CARBON, HYDROGEN AND NITROGEN IN ORGANIC COMPOUNDS IN MILLIGRAM AND SUBMILLIGRAM QUANTITIES BY THE APPLICATION OF SELF-INTEGRATING THERMAL CONDUCTIVITY MEASURING METHODS. [Vollautomatische Anlage zur

gleichzeitigen Bestimmung von Kohlenstoff, Wasserstoff und Stickstoff in organischen Verbindungen and Milligram und Sub-Milligram-Mergen unter Verwendung einer selbstintegrierenden Wärmeleitsfähigkeitsmessmethodik.] Helvetica Chim. Acta (Switzerland), 46(6):2369-2388, 1963. 45 refs. Translated from German. Ministry of Aviation, London, England, Technical Information and Library Services, TIL/T.5689, 25p., Jan. 1967.
CFSTI: AD 807818

An analyser for the simultaneous determination of carbon, hydrogen and nitrogen in organic compounds is described. The samples are burned in a static system in oxygen and the combustion products are determined using a self-integrating thermal conductivity method. Up to 16 previously weighed samples of 0.5 - 2.0 mg are analysed without any manual help and the results are presented in digital form. One determination takes between 7 and 13 minutes. At present the standard error of a single determination is 0.20, 0.8, and 0.30 percent (absolute) for carbon, hydrogen, and nitrogen, respectively; but these figures may easily be improved by minor modifications. Compounds of the elements C, H, N, O, Cl, Br, I, F, S, P, As, Hg, and Co without impurities have been analysed. Compounds which burn explosively, such as aromatic nitrobodies and perchlorates, led to no difficulties. A cobalt-containing perchlorate, which could not be analysed properly by conventional methods, gave perfectly accurate determination results. Slightly volatile compounds can be brought to combustion in completely sealed glass capillaries.

D-7876L

Deckert, Walter
THE EXACT DETERMINATION OF LOW CARBON DIOXIDE CONCENTRATIONS IN AIR. Z. Anal. Chem., Vol. 176, p. 163-169, 1960. 10 refs. Translated from German. Feltman Research Labs., Picatinny Arsenal, Dover, N. J., TT-45, 11p., June 1967.
CFSTI: AD 814968L

In view of the greatly increased demands on the exactness of air analyses, the generally used methods to determine low CO_2 contents in the air are worthless. The usual reverse titration process can be improved employing deep-cooled alcoholic solutions as absorption fluids. Still simpler is a newly developed method, which is based upon the quantitative absorption of the CO_2 contents in 0.25 percent ammoniacal alcohol at -80°C, and titration of the carbonate formed in the alcoholic solution with 0.1 n NaOH solution and thymolphthalein as indicator. By means of this method, the CO_2 content of room air, atmospheric air, and of carbon-dioxide-poor exhaust gases can be determined with an exactness of at least 99 to 101 percent. (Author's summary)

D-7930

Dubrovskaya, F. I. and I. P. Lukina
EFFECT OF LOW CONCENTRATIONS OF VALERIC ACID VAPOR ON EXPERIMENTAL ANIMALS. [Deistvie parov valerianovoi kisloty v malykh konsentratsiyakh na organizm podopytnykh zhivotnykh.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):193-196, July-Sept. 1966. 2 refs.

Albino rats divided into 3 groups of 10 each were exposed to valeric acid vapor for 97 days in concentrations of approximately 1.7 mg/m^3, 0.14 mg/m^3, and 0.006 mg/m^3, respectively. Another 10 rats served as a control group. Blood was analyzed three weeks after exposure and at the end of exposure for total alkalinity of blood, oxygen consumption, content of chlorides, RBC, hemoglobin content, and osmotic resistance of erythrocytes. Observations were made as to changes in general condition, variation in the porphyrin metabolism, and the latent period of reflex activity. A concentration of 1.7 mg/m^3 caused a rise in the blood alkaline reserve, a fall of chlorides content of the blood and a shortening of the reflex latent period. The concentration of 0.14 mg/m^3 increased the blood alkaline reserve and oxygen intake, and decreased the latent period of reflex response. The 0.006 mg/m^3 concentration had no effect and is suggested as the daily average maximum permissible concentration of valeric acid in the atmosphere.

D-8130

Vigdorchik, E. A.
DETERMINATION OF AIR DUSTINESS ACCORDING TO OWEN'S METHOD. Gigiena i Epidemiologiya, No. 11, p. 10-19, 1928. 13 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 1-12, May 1960.
CFSTI: TT 60-21475

The Owens method was tested in order to determine its possible use in routine sanitary inspection for the determination of air dustiness in manufacturing plants. On the basis of tests to which Owens apparatus was subjected in the dust chamber and under manufacturing plant conditions, it can be stated that the method and apparatus present a considerable advance in the problem of dust study. Particularly valuable characteristics of the instrument are: a. Particles suspended in the air measuring 0.3 μ and above in diameter can be reliably counted; b. Differential particle counts can be made simultaneously; c. The dusts studied microscopically remain unchanged because of the special method used in making the preparations; d. Differences in duplicate readings do not exceed the limits of experimental error; e. Sample collecting is not time consuming; f. As a consequence to the rapidity of sampling, the dynamics of the dust-laden air can be studied reliably; g. The apparatus is of small size and is easily portable.

D-8131

Patrina, G. V.
DETERMINATION OF TELLURIUM DIOXIDE IN THE AIR. Gigiena i Sanit., No. 3, p. 46, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 13-14, May 1960.
CFSTI: TT 60-21475

A colorimetric method was developed for the determination of tellurium dioxide in the air, based on the following principle: in reducing tetravalent tellurium salts to elementary tellurium with stannous chloride in hydrochloric acid, the color of the solution changes to light or dark brown. By comparing the color intensity of the test sample with a standard set of colors the amount of tellurium dioxide can be determined. The preparation of reagents, collection of air samples, and the analytical procedure are outlined.

D-8132

Poletaev, M. I.
COLORIMETRIC DETERMINATION OF SMALL QUANTITIES OF STYRENE IN THE AIR. Gigiena i Sanit., No. 3, p. 46-47, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 14-16, May 1960.
CFSTI: TT 60-21475

The determination of small quantities of styrene is based on its nitration property and is made photocolorimetrically. An experimental attempt was made to absorb styrene directly into the nitrating mixture. Absorption was made from a special bottle, the air of which was saturated with styrene vapor, by aspirating the test air through two absorbers connected in succession. Nitrated styrene vapor acquired a yellow color; the nitrated product was completely retained in the first absorber even when the air was aspirated at a rate of 1 l/min. To prevent the yellow color from fading it was necessary to change the medium as follows: after styrene vapors were absorbed from the air the content of the absorber was diluted with 3 ml of distilled water and neutralized by a 25 percent ammonia solution until litmus paper showed an alkaline reaction. Final colors were compared with colors yielded by standard styrene solutions in carbon tetrachloride.

D-8133

Chemodanova, L. S.
THE DETERMINATION OF SMALL QUANTITIES OF PHTHALIC ANHYDRIDE IN THE AIR OF INDUSTRIAL PREMISES. Gigiena i Sanit., No. 4, p. 48-49, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 16-18, May 1960.
CFSTI: TT 60-21475

Phthalic anhydride in the air of industrial premises was determined colorimetrically. The method is based on the conversion of phthalic anhydride to fluorescein. The reagents used are outlined. Absorption of phthalic anhydride from the air was tested with absorbent cotton, glass "wool", filter paper, and porous glass discs. Best results were obtained with ash-free filter paper.

D-8134

Aruin, A. S.
DETERMINATION OF MERCURY IN ATMOSPHERIC AIR. Gigiena i Sanit., No. 5, p. 46, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 18-20, May 1960.
CFSTI: TT 60-21475

Mercury in atmospheric air is determined colorimetrically. A detailed description of the preparation of samples and standards is giver. The experimental samples are compared colorimetrically with the standards.

D-8135

Shchirskaya, V. A.
THE DETERMINATION OF OZONE IN THE PRESENCE OF NITROGEN DIOXIDE AND HYDROGEN PEROXIDE. Gigiena i Sanit., No. 8, p. 41-43, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 20-23, May 1960.
CFSTI: TT 60-21475

In search of a new method for the determination of ozone the following were investigated: chronic anhydride as an absorbent for the fumes of hydrogen peroxide and silica gel saturated with a 0.02 M solution of potassium dichromate in concentrated sulfuric acid as an absorbent for nitrogen dioxide. In the determination of ozone in the presence of H_2O_2 chromic anhydride can be used as an absorbent for the hydrogen peroxide vapor in 0.005 - 1.1 mg/l concentrations. Finely granulated silica gel saturated with a 0.02 M solution of potassium dichromate in concentrated sulfuric acid retained nitrogen dioxide present in the air in 0.001 - 0.02 mg/l concentrations. It can be used in the determination of ozone in the air in the presence of nitrogen dioxide.

D-8136

Senderkhina, D. F.
DETERMINATION OF CHLORINATED HYDROCARBONS IN THE AIR BY THE METHOD OF MICRO-COMBUSTION. Gigiena i Sanit., No. 8, p. 43-45, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 23-27, May 1960.
CFSTI: TT 60-21475

The method described is based on the quantitative oxidation of chlorinated hydrocarbon vapor in a combustion chamber equipped with a platinum coil heated to redness. The combustion products are then passed through an absorber solution and the ionic chlorine determined nephelometrically. With an appropriately prepared standard scale accurate determinations can be made in solutions containing 0.00 mg of chlorine in 1 ml. Control tests were made with ethylene chloride, chloroform, carbon tetrachloride, and trichlorethylene. A portable apparatus for the determination of chlorinated hydrocarbons in the air by the micro-combustion method was constructed. The micro-combustion method described proved to be accurate for the determination of thousandths of a milligram of chlorine within 30 to 40 minutes. A new micro-absorber is described which assures complete absorption of products of hydrocarbon combustion. Air samples are aspirated into gas pipettes filled with a saturated solution of sodium sulfate or into vacuum gas pipettes.

D-8137

Morozov, V. A.
COLORIMETRIC DETERMINATION OF LEAD IN THE ATMOSPHERIC AIR. Gigiena i Sanit., No. 5, p. 46, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 27-28, May 1960.
CFSTI: TT 60-21475

In the presence of lead salts, quinalizarine produces a characteristic color. The reaction is sensitive to 0.005y of lead in 2 ml. For the quantitative determination of lead with the aid of this reaction a standard scale was prepared in a set of test tubes containing 0.05, 0.1, 0.25, 0.5, 1, 2, 3, and 4 y in 2 ml. The resultant color in the test tubes ranged from yellow to bluish pink. The control tube had a yellow color. Copper, zinc and iron must be removed from the test sample since they, too, produce color reactions with quinalizarine. This method was used in the determination of lead in the atmospheric air around industrial plants, the exhaust discharges of which contained lead. In this study, 50 - 200 ml of air were aspirated through the filter paper. Lead concentrations range between 0.05 and 2.75 y/m^3.

D-8138

Polezhaev, N. G.
DETERMINATION OF ACTIVE CHLORINE IN THE AIR. Gigiena i Sanit., No. 11, p. 46, 1955. Translated from

Russian by B. S. Levine. U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 29-30, May 1960.
CFSTI: TT 60-21475

Existing methods for the colorimetric determination of small quantities of active chlorine using dimethyl-paraphenylene-diamine-hydrochloride possess high sensitivity; they can be used for the determination of chlorine in the presence of hydrogen chloride in the absence of other oxidizers which produce a similar color. In such methods the chlorine is absorbed directly into a dilute solution of dimethyl-paraphenylene-diamine acidified with HCl; the reaction takes place the moment aspiration of the air begins. The color produced in the solution is not permanent; therefore, the colorimetric determination must be made without delay. Comparison is made with an artificially prepared standard scale. High chlorine concentrations partly or totally bleach out the reaction color; therefore, the following modifications were introduced. The dimethyl-paraphenylene-diamine absorber solution was replaced by a 1 percent potassium iodide solution in a 1 percent solution of sodium acetate. As the air is being aspirated through the new absorber solution the free chlorine replaces an equivalent amount of iodine. Iodine dissolved in potassium iodide produced a red color with dimethyl-paraphenylene-diamine which made possible the determination of the replaced iodine colorimetrically; the amount of iodine thus determined was then converted to its chlorine equivalent by multiplying the obtained value by 0.28.

D-8139

Alekseyeva, M. V. and E. V. Elfimova
FRACTIONAL DETERMINATION OF HYDROCHLORIC ACID AEROSOL AND OF CHLORIDES IN ATMOSPHERIC AIR. Gigiena i Sanit., 23(3):71-72, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 31-33, May 1960.
CFSTI: TT 60-21475

A method for the determination of hydrochloric acid aerosol in the presence of chlorides has been developed. To accomplish this, hydrochloric acid was determined by microtitration and chloride ions nephelometrically; chloride gas was then calculated from the two values. The determination of hydrochloric acid aerosol in the air is complicated by the presence in the air of other acid aerosols, sulfuric acid aerosol in particular. The procedure to avoid the loss of HCl in the presence of H_2SO_4 is presented also. The method was used in analyzing 37 samples of atmospheric air. Air samples were collected for 4 - 7 hours under different meteorological conditions. The results proved that aerosol of hydrochloric acid can be present in the air.

D-8140

Rykhter, E. V. and N. V. Shlygina
DETERMINATION OF DUST IN THE ATMOSPHERIC AIR WITH AN ELECTRO-PHOTOCOLORIMETER. Gigiena i Sanit., 23(9):18-22, 1958. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 33-38, May 1960.
CFSTI: TT 60-21475

A simpler method for the determination of dust concentrations in atmospheric air was accomplished by the photonephelometric method utilizing the electrophotocolorimeter. Dust samples were obtained with the aid of the alcohol-glycerine mixture, as the absorber solution. In determining dust [illegible] of atmospheric air with the aid of the electrophotocolorimeter specific standard nomographs must be plotted for each type of dust. To eliminate the effect of dust created by traffic during the warm season of the year the investigations should be conducted preferably after a rain or at some distance from the highways. An important factor in determining the dust concentration of atmospheric air with an electrophotocolorimeter is the stability of dust suspensions in the absorbing solution. Special experiments were carried out for the clarification of this point. The results showed that dust suspensions remained stable and that it was possible to make determinations with the photocolorimeter several days after samples were collected. The method permits rapid collection and analysis of air samples and is applicable to the evaluation of the effectiveness of dust-removing equipment. Samples can be collected and analyses made under all types of operating and processing conditions, and maximal single dust concentrations can be determined in a short time with a high degree of accuracy.

D-8141

Ignatovich, Yu, V. and M. M. Epstein
A METHOD FOR THE DETERMINATION OF PHYTONCIDES IN THE AIR. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 51-54, May 1960.
CFSTI: TT 60-21475

The method used in the qualitative and quantitative determination of phytoncides is based on the principle of magnetic and dielectric medium permeability. Determinations were made of changes in the index of refraction caused by the phytoncides and their concentrations in the air computed accordingly. Changes in the refraction indexes of water or air due to the presence of phytoncides were determined with the aid of an interferometer. With this instrument it was possible to determine the difference in the refraction index of the two media with an accuracy up to 0.6×10^{-7}. Determinations were made of phytoncide concentrations in close proximity of plants in the woods and flower gardens. The results showed that under natural conditions there was a measurable phytoncide concentration. Phytoncides of pine needles yielded the highest readings. Tests were then made of the possibility to maintain constant pine phytoncide concentrations with the aid of the interferometer for the laboratory study of their biological activity. The effect of pine phytoncides on the sciatic nerve of a frog was studied. Measurements of the EMF generated within the nerve were taken every 3 minutes. The course followed by the curves indicated that the drop in EMF was proportional to the concentration of the phytoncides. The method here described should make possible the study of bio-effects of controlled phytoncide concentrations.

D-8142

Mokhov, L. A. and V. S. Khalturin
A RAPID METHOD FOR THE DETERMINATION OF NITROGEN OXIDES IN THE AIR. Laboratornoe Delo, 4(2):26-27, 1958. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 54-56, May 1960.
CFSTI: TT 60-21475

For rapid determination of nitrogen oxides in the air, the indicator tube method is used containing silica gel, treated with benzidine-hydrochloride, 8-naphthol, $NiCl_2$, and dried. In the presence of nitrogen oxides its color changes from the initial white to a stable red, the intensity of which is proportional to the concentration of nitrogen oxides in the air. The color developed in the tube is compared with a standard scale. Average sensitivity of the indicator equals

0.0005 mg/l and the precision is ± 3.5 percent.

D-3144

Khukhrina, Ye. V. and Ye. I. Vorontsova
A COMPARATIVE EVALUATION OF DIFFERENT GRAVIMETRIC METHODS FOR THE DETERMINATION OF DUST CONCENTRATION IN THE AIR. Gigiena i Sanit., No. 11, p. 20-25, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 70-77, May 1960.
CFSTI: TT 60-21475

The use of cotton filters, glass wool and filter paper was investigated. The vacuum and the hot air methods for drying of filter adapters were also re-examined. Ejector mine aspirators, a mine injection aspirator and a rotary air (fan) blower aspirator were also checked for their efficiency. For this evaluation study a special dust chamber was constructed. Results of experiments indicated that the cotton, glass wool and ash-free paper filters can be recommended for use in air sample collection for the gravimetric determination of air dust concentrations. With a rate of air flow of 15/l min the retention of dust was shown to be complete at a pressure drop of 150 mm of water when absorbent cotton or glass wool filters were used, and of 200 to 250 mm of water when ash-free paper filters were used. The use of non-absorbent cotton can not be recommended because of the difficulty of drying it to a constant weight. The hot-air speed drying for bringing air filters to a constant weight is recommended if the process is performed twice. Best results for drying ashless filters were obtained with a three-stage drying; one of 6 hours, and two of 2 hours each. Under actual conditions of manufacturing it may not be feasible to operate an electrically driven vacuum pump and air blowers or the ejector could not be connected to an available source of compressed air; under such conditions use should be made of ejectors developed by the Ministry of Coal Industry; preference is here expressed for ejector AER-1. Results of the rotary air blower equipped with pneumometers demonstrated its good qualities, and its quantity production is recommended.

D-3145

Gernet, E. V.
A COMPARATIVE STUDY OF THE RETENTION CAPACITY OF DIFFERENT FILTERS USED IN THE GRAVIMETRIC DETERMINATION OF SMOKE SUSPENDED AEROSOLS. Gigiena i Sanit., 23(2):77-83, 1958. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 78-96, May 1960.
CFSTI: TT 60-21475

Cotton fiber, paper filters, porous glass filters and liquid absorbers were evaluated to determine the best suited filtering material for the gravimetric determination of a dispersed phase of toxic aerosols. The results of the investigation showed that determination of concentrations of highly dispersed smoke (particles of which ranged between 0.1 - 1.5 microns) could be satisfactorily accomplished by aspiration of air samples through ash-free filter paper of the makes tested, or through glass filter plates Nos. 2 and 3. Filter paper has the additional advantage of combustibility thereby reducing to a minimum loss due to absorptive retention by the filtering material. Cotton filters, glass filter plates No. 1 and liquid absorber apparatus of the type of Gernet-Rybkter are not recommended for use in the study of aerosols (smokes) of high dispersion.

D-3157

Litvinov, V. F. and N. N. Litvinova
ELECTROSTATIC APPARATUS FOR THE COLLECTION OF ATMOSPHERIC DUST SAMPLES. Gigiena i Sanit., No. 9, p. 16, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 157-160, May 1960.
CFSTI: TT 60-21475

An electrostatic apparatus with a dielectric electrode for the collection of atmospheric dust samples was redesigned. The basic shortcoming of the original model was its weight. Also the need to enclose the transformer and the high voltage line and its operation required a 100 w alternating current which precluded it from use under certain field conditions. In designing the new electroprecipitator model, provision was made for the possible replacement of the cup-shaped condenser-anemometer by a special flow master. The direct current of 6 - 8 v. and 1 - 2 mA (milliamperes) required for the operation of the new electric-filter dust collector was controlled by a special electric bulb arrangement. Electric precipitators used in laboratories were operated by an alternating city current, and those used in the field were operated by special batteries. The original model weighed over 30 kg, the redesigned laboratory model weighs about 10 kg; the field model with the storage battery weighs about 15 kg. The efficiency of industrial dust-catching by the newly designed apparatus was tested in the polishing shops of one of the industrial plants. Samples were taken simultaneously with field model and with cotton fiber filter. The results indicated that with dust concentrations up to 10 mg/m^3 both methods yielded satisfactory gravimetric results. However, the electrofilter type yielded higher concentration values in the majority of cases. Simultaneously, air dust samples were collected with a particle counter to determine collected degree of dispersion. The redesigned electric precipitator models are convenient, simple, easily portable and can be used for the collection of dust samples of relatively low concentration. Experiments conducted in mines demonstrated that the apparatus was not suitable for the collection of dust samples from air with dust concentration above 30 - 50 mg/m^3.

D-3158

Smetanin, N. I.
METHOD FOR THE COLLECTION OF SAMPLES OF AIR DUST WITH PARTICLE DIAMETERS OF LESS THAN 5 μ. Gigiena Truda i Professional'nye Zabolevaniya, 2(2):52-54, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 161-164, May 1960.
CFSTI: TT 60-21475

The allowable concentration of dust in Russia is based on the quantity of free silicon dioxide contained in it (from 2 to 10 mg/m^3) regardless of the degree of dust dispersion. Dust particles of 1 - 5 μ in diameter are most penetrating and most harmful to man. Grinding larger particles of mixed dust with the smaller ones artificially changes the content of free silicon dioxide in the smaller dust particles. Therefore, under practical conditions it is desirable to study the effect of dust in its naturally occurring state in differential fractions according to diameter sizes. A simple apparatus has been developed for the separation and collection of air pollution dust fractions having particle diameters of 5 μ and less. The procedure is essentially one of fractional air dust centrifugation. The apparatus is used for the separation from surface dust of highly dispersed particles directly in the laboratory. Dust deposited in the process of manufacturing is collected, then screened through a sieve of 40 micron mesh. Fifty grams of the sifted dust is placed into a tightly woven cloth bag, then vigorously shaken over the revolving apparatus for 3 - 5 minutes. The desired fraction of dust is collected from a celluloid strip. In this way it is possible to obtain a quantity of highly dispersed dust required for laboratory and experimental study.

D-8159

Kachor, L. F.
ASPIRATORS FOR SAMPLING ATMOSPHERIC AIR DUST AND GASES. Gigiena i Sanit., No. 4, p. 48-51, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 165-168, May 1960.
CFSTI: TT 60-21475

A new type of portable apparatus for collecting air samples which is operated by direct suction from an automobile carburetor has been developed. Two types of automobile aspirators were described for atmospheric dust sampling. Automobile aspirators have been checked in practical work and found to be satisfactory; their wide use in determining air dust concentration in field work is recommended. The automobile aspirator has been used in determining gaseous air pollutants such as SO_2 and was found to be somewhat wanting. For such purposes a special "field aspirator" of the accumulator type was assembled.

D-8160

Pokrovskii, V. N., Ya. G. Kishko, and A. P. Ostranitsa
ADAPTATION OF THE YU. A. KROTOV APPARATUS TO BACTERIOLOGICAL STUDIES OF ATMOSPHERIC AIR UNDER FIELD CONDITIONS. Lab. Delo, 4(2):45-46, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 169-170, May 1960.
CFSTI: TT 60-21475

The following modifications of the original Krotov apparatus were introduced to make the apparatus suitable to bacteriological studies of atmospheric air under field conditions: the alternating current motor was replaced by a transformer with an incoming current at 12 volts, an outgoing current at 120 volts and equipped with a change-over coil switch. The axle of the converter was extended for the attachment of a small pressure blower. Experience with the modified apparatus showed that the results of the investigations were independent of the type of current used, whether direct or alternating, as well as the type of voltage, such as 6 to 12, 127 or 220 volts; but the rate and direction of air aspiration were factors of paramount importance. Old models of Krotov apparatus found in laboratories can be easily converted into the improved type.

D-8169

Zubarev, V. A.
THE STUDY OF BACTERIAL AIR POLLUTION. Gigiena i Sanit., No. 7, p. 35-36, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 219-221, May 1960.
CFSTI: TT 60-21475

A device for the determination of bacterial content in the air is described. It was designed to determine with greater accuracy the degree of bacterial distribution in the air of an investigated enclosure. The apparatus is simple and can be made in any mechanical shop. Hygroscopic cotton is used as filtering material. Control tests showed the following: the cotton filter retained all the bacteria contained in the aspirated air. In washing the cotton filter with three successive portions of physiological solution 96 - 98 percent of the retained microorganisms were freed.

D-8171

Formicheva, N. I. and P. A. Mel'nikova
RAPID DETERMINATION OF SMALL QUANTITIES OF DIMETHYLANILINE IN THE AIR. Gigiena i Sanit., No. 5, p. 49-52, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 1-5, Aug. 1960.
CFSTI: TT 60-21913

A rapid colorimetric method is described for the determination of small quantities of dimethylaniline in the air, based on the formation of a yellow colored paranitrosobasic salt. The air aspiration and the colorimetric estimation with the aid of an artificial scale requires approximately 15 to 20 minutes; the dimethylaniline content per 1 ml of the air must be within 0.001 - 0.01 mg. The method is simple, requires no complex equipment and is suitable for dimethylaniline determination in the air of industrial premises at concentrations in the order of hundredths and thousandths of a milligram per liter.

D-8172

Bykhovskaya, M. S. and M. I. Poletaev
THE POLAROGRAPHIC METHOD IN SANITARY-HYGIENIC INVESTIGATIONS. Gigiena i Sanit., No. 12, p. 47-50, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 5-10, Aug. 1960.
CFSTI: TT 60-21913

It was demonstrated that polarographic determinations of small quantities of lead in the air can be made by using 5 percent nitric acid solution, 33 percent ammonium acetate solution and 1 percent sodium acetate in 1 percent acetic acid as the basic electrolyte medium. Zinc and copper did not interfere with the polarographic determination of lead. It is recommended that 30 percent ammonium acetate be used as the basic electrolytic medium at pH of 6.8 - 7.0 in the separate determination of lead, zinc and copper. A 5 percent acetic acid solution is recommended for obtaining test wash samples from the skin or from working clothes. Lead in blood can be determined only after the destruction of the organic substrate to which it is bound; a 33 percent ammonium acetate solution is recommended as the best basic electrolyte medium. Small quantities of zinc, copper, and cadmium can be determined polarographically in ammonia solution of ammonium chloride when present individually or simultaneously.

D-8176

Matveev, P. N.
AN APPARATUS FOR THE DETERMINATION OF DISPERSED POLYELEMENTAL AIR POLLUTION. Lab. Delo, 3(1):47-48. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 62-63, Aug. 1960.
CFSTI: TT 60-21913

The apparatus described allows the simultaneous collection of air samples for the determination of air dustiness.

configuration and chemical composition of the dust particles and for the identification of the microbial population. It consists of four parts: a collecting chamber with two microscope slides forming an angle of 90 degrees for the quantitative, morphological, and qualitative chemical analyses of the particles; depressions at an angle of 45 degrees to hold Petri dishes with appropriate media for the study of the airborne microorganisms; a wind vane which keeps the open part of the collecting chamber and the Petri dishes exposed to the blowing wind, and a supporting stand. The apparatus can be used under all conditions. It requires no source of power for its operation, it is portable and can be used under complicated conditions of atmospheric air investigations of enclosed spaces.

D-3179

Mokhov, L. A., Yu. F. Udalov, and V. S. Khalturin
RAPID DETERMINATION OF NITROGEN OXIDES IN THE AIR OF INDUSTRIAL PREMISES BY SPECIAL TUBULAR INDICATORS. Zh. Prikl. Khim., 32(2):452-453, 1959. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 56-59, Aug. 1960.
CFSTI: TT 60-21913

In this procedure H-acid, n-aminobenzoic acid, and nickel chloride are adsorbed upon silica gel. The gel indicator thus obtained gradually changes its initial color from light pink to a brown-red in the presence of nitrogen oxides. As a result of the reaction between the oxides of nitrogen and the n-aminobenzoic acid, diazonium salt is formed. The diazonium salt then combines with the H-acid, which is the nitrogenous component in this reaction, while the nickel chloride acts as the catalytic agent to form the dyestuff. In making nitrogen oxide determination in the air, both ends of the prepared indicator tube are opened, and 100 ml of the air to be tested is aspirated through the tube from the wide end in the direction of the cone-shaped end; the coloring of the indicator is compared with that of a standard scale, and the amount of nitrogen oxides expressed in mg/l. The sensitivity of the proposed tubular indicators was determined by checking against the standard Gris-Illosvay method and was found to be 0.0005 mg/l.

D-3223

Ry'khter, E. V.
DUPLICATE SAMPLES IN AIR POLLUTION INVESTIGATIONS IN INDUSTRIAL PREMISES. Gigiena i Sanit., 24(4):64-66, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 209-212, Jan. 1961.
CFSTI: TT 61-11149

In dynamic air investigations which use effective absorbers, or when air samples are taken and analyzed with the aid of special automatic apparatuses which eliminate the possibility of subjective errors the practice of taking duplicate samples can be discontinued. However, the majority of industrial-sanitary laboratories cannot conduct investigations by the dynamic method, due to lack of necessary equipment. Duplicate tests yielding identical results regarding concentrations of harmful substances in the air offer assurance of the correctness of the data obtained. In case of a discrepancy exceeding 20 percent, the cause of the discrepancy must be established immediately; if this cannot be done, the results should be disregarded. Duplicate samples are essential to check the correctness of analytical results and therefore, are necessary when dealing with small number samples.

D-3226

Likina, M. T. and G. L. Barodina
LINEAR-COLORIMETRIC METHOD FOR THE DETERMINATION OF CARBON DIOXIDE IN AIR. Gigiena i Sanit., 24(3):30-32, 1959. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 212-215, Jan. 1961.
CFSTI: TT 61-11149

A linear-colorimetric method for the determination of carbon dioxide in sewage system air is described. The advantages of this method over those used by the sanitary chemists are speed of the analysis and the ease with which it can be used under field conditions even at low air temperature, since the determining chemical reaction depends upon a solid absorber. Hydrazine-hydrate ($N_2H_4 \cdot H_2O$) is a good carbon dioxide absorber and it combines with basic fuchsin in solution to form an unstable colorless solution. The original fuchsin color is restored in proportion to the carbon dioxide concentration in the air. Best results are obtained with 125 ml of the CO_2-containing air. This volume of air can be passed through the indicator tube for the determination of CO_2 concentrations ranging between 0.5 and 9.0 percent. Results of experiments indicate that unsaturated hydrocarbons, gasoline vapor, and small amounts of hydrogen sulfide affected neither the height nor the color in the indicators; however, when the concentration of hydrogen sulfide was 0.3 mg/l or more, the color of the column faded almost completely. However, the maximum content of the hydrogen sulfide in the air of the sewage system never exceeded 0.07 mg/l.

D-3256

Buck, Manfred and Heinrich Stratmann
THE JOINT AND SEPARATE DETERMINATION OF NITROGEN DIOXIDE IN THE ATMOSPHERE. STAUB (English translation), 27(6):11-15, June 1967. 10 refs.
CFSTI: TT 67-51408/6

In the use of the Saltzman reagent for the determination of nitrogen dioxide in the atmosphere, 1 mol NO_2 is equivalent to 1 mol NO_2 from sodium nitrate. It has been shown that this ratio factor depends on NO_2 concentration; for 6 g NO_2/Nm^3 it is about 0.62 and with increasing NO_2 concentration it approximates the value of 1. Operating conditions are proposed for combined and separate determination of NO and NO_2, under which no NO_2 losses occur as a result of absorption of the required NO oxidation.

D-3257

Baum, Fritz, Inge Reichardt, and Wolfgang Steinbach
SIMPLE MEASURING ARRANGEMENT FOR RECORDING HYDROCARBON CONTENT. STAUB (English translation), 27(6):16-19, June 1967. 11 refs.

A method for using a batch-sampling gas-chromatograph with flame-ionization detector to record continuously the presence of hydrocarbons is described. Use of this measuring device is illustrated by several examples. Hydrocarbons are thermally ionized in a hydrogen flame in the flame-ionization detector. Flue gases of an oil stove with vaporization burner, flue gases of a medium-size waste incinerator, and automobile exhaust were measured. The hydrocarbon content of the flue gas of an oil stove only exceeded that of the air in the laboratory above a combustion rate of 0.5 kg of oil per hour. With decreasing chimney draft the hydrocarbon content of the flue gases rose sharply, being accompanied by an increase of the Bacharach soot number. When the chimney draft was throttled to 0.1 mm W.G. at the maximum combustion rate, the concentration of hydrocarbons rose to 350 times the value at normal operation. The combustion phases in a medium size waste incinerator can be directly observed with the measuring device. Total hydrocarbon concentration in the exhaust of an automobile at various operating conditions is presented. In neutral, a slight increase in hydrocarbon concentration was recorded. During acceleration in neutral the concentration dropped immediately. The concentration varied when the position of the accelerator was changed. On a 14 percent grade, finally, the concentration dropped briefly and then rose considerably.

D-8261

Quitter, Volker
DUST-MEASURING TECHNOLOGY AND THE DUST ATLAS FROM THE ASPECT OF THE DUST-CONTROL EXPERT. STAUB (English translation), 27(5):8-11, May 1967. 11 refs.
CFSTI: TT 67-51408/5

Dust technology has reached the most remote branches of industry. Dust separation and the necessarily concomitant analysis of dusts can facilitate the improvement of a manufactured product, promote the preservation of health in human beings, animals and plants, or increase the profitability of an installation by the recovery of useful dusts. The requirements a dust atlas must meet are many. The purpose of the atlas should be clarified prior to classifying the dusts. The branches of industry that would be accentuated by a dust-control expert in the compilation of a dust atlas are presented. Dust parameters are best recorded on interchangeable index cards in three columns: chemical parameters of dust and carrier gas; physical parameters of the dust; textual description of dust with micrograph and residue curve. The most important task in compiling a dust atlas is the establishment of suitable and uniform procedures and methods of measurement. Measuring instruments for the various parameters must be developed. Also those parameters should be included in the dust atlas for which there is as yet no technical application.

D-8340

Thomas, Jess W. and David Rimberg
A SIMPLE METHOD FOR MEASURING THE AVERAGE CHARGE ON A MONODISPERSE AEROSOL. STAUB (English translation), 27(8):18-22, Aug. 1967. 11 refs.
CFSTI: TT 67-51408/8

A simple parallel plate electrostatic precipitator was used to determine the average charge of a monodisperse aerosol. The fractional collection efficiency of the precipitator was measured as a function of plate voltage and data extrapolated to zero voltage. The extrapolation gave the average charge per particle of the monodisperse aerosol. The method was confirmed by use of the classical Millikan technique for determination of charge on individual particles. The average charge of aerosols in charge equilibrium with air ions was also determined for comparison with values calculated from the Boltzmann equation. It was found that the average charge per particle was somewhat greater than that predicted by the Boltzmann equation. (Authors' summary, modified)

D-8375

Pfefferkorn, Gerhard and Rochus Blaschke
DUST ANALYSIS WITH THE AID OF THE SCANNING ELECTRON MICROSCOPE "STEREOSCAN." STAUB (English translation), 27(7):30-33, July 1967. 3 refs.
CFSTI: TT 67-51408/7

The raster electron microscopy offers new possibilities of investigating quantitatively industrial dusts within the whole range of particle sizes. As compared with optical microscopy a raster electron microscope has a higher visibility in the case of a magnification of 20- to 50,000 times, and a surprisingly high depth of focus. A raster electron microscope requires very little preparation in comparison with a conventional optical microscope.

D-8433

Tupeeva, R. B.
THE DETERMINATION OF METHOXONE IN AIR. [Metody opredeleniya metoksona v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):72-76, April-June 1967. 4 refs.
CFSTI: TT 67-51409/2

The optimum conditions were established for the determination of methoxone by the method of "wet combustion" with a mixture of sulfuric acid and potassium dichromate, followed by iodometric determination of the liberated chlorine. The sensitivity was found to be 0.030 mg methozone in the analytical volume. A sensitive method was devised for the determination of methoxone based on its hydrolysis with concentrated sulfuric acid, with the liberation of formaldehyde, followed by the photometric determination of the latter with chromotropic acid. The sensitivity was found to be 0.010 mg in the analytical volume. The hydrolysis of methoxone with concentrated sulfuric acid in the presence of chromotropic acid provides a more sensitive and accurate method for the determination of this substance.

D-8436

Manita, M. D., M. V. Rumyantseva, and M. E. Eglite
SPECTROPHOTOMETRIC DETERMINATION OF OZONE WITH DIHYDROACRIDINE IN THE ATMOSPHERE OF POPULATED AREAS. [Spektrofotometricheskii metod opredeleniya ozona v atmosfernom vozdukhe naselennykh mest s reagentom-digidroakridinom.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):219-224, April-June 1967. 3 refs.
CFSTI: TT 67-51409/2

A spectrophotometric method is suggested for the determination of ozone in the atmosphere. It is based on measurements of the optical density of an ethanol solution of acridine produced by the action of ozone on dihydroacridine. The optical density of the sample solution is measured at a wavelength of 249.5 nm in a quartz cell of 1 × 1 cm by an SF-4 spectrophotometer. This spectrophotometric method is suitable for determining ozone in the near-ground air layer in the presence of other oxidants with sufficient accuracy. The presence of ozone (in addition to other oxidants) was found in the near-ground air layer of a large industrial city such as Moscow.

D-8437

Gitlin, N. N., G. F. Budanov, O. I. Demochka, and M. A. Zabezhinskii
ANALYSES OF EXHAUST GASES FROM GASOLINE ENGINES. [K voprosu ob analize sostava otrabotavshikh gazov benzinovykh dvigatelei.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):225-228, April-June 1967. 3 refs.
CFSTI: TT 67-51409/2

A stationary automatic opticoacoustic gas analyzer for the rapid monitoring of the composition of exhaust gases from automobile engines is described. The principle is based on the determination of carbon monoxide concentration. The opticoacoustic principle underlying instruments of this kind involves measurement of the absorption of infrared radiation by the gas, and transformation of the acoustic energy into electric voltage, which is measured by a potentiometer. Its distinctive features are its selectivity, high sensitivity, and accuracy. For example, the sensitivity of the opticoacoustic gas analyzer is one relative percent, corresponding approximately to 0.1 percent when the scale range is 0 to 10 percent CO. The error lies within 2.5 percent of the upper scale limit. The analyses are considerably simplified and are made more accurate by automation of the analytical process, and by the use of a control mixture supplied together with the instrument for checking. Experience gained in a 3-year operation showed that the instrument adapted for engine testing is quite suitable for the rapid and accurate determination of CO in the exhaust gases of automobile engines. It would be useful to supply such instruments to all motor pools (with at least 50 - 70 automobiles), service stations for automobiles, district branches for government inspection of automobiles, and large sanitary-epidemiological centers. With this instrument, it is possible to check the condition of engines after technical servicing and routine checks and to test automobiles which evolve an excessive amount of smoke. The introduction of instruments for the rapid monitoring of the composition of exhaust gases will help to reduce the concentration of harmful substances in urban atmospheres and improve the economic indices and service life of engines.

D-8446

Gavrilova, L. I.
METHODS FOR THE DETERMINATION OF SODIUM AND BUTYL 2, 4-DICHLOROPHENOXYACETATES IN AIR. [Metody opredeleniya natrievoi soli i butylovogo efira 2, 4-dikhlorfenoksiuksusnoi kisloty v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):394-396, April-June 1967. 4 refs.
CFSTI: TT 67-51409/2

Different colorimetric methods for the determination of different preparations of 2, 4-D in air were tested in order to determine which was most suitable for routine sanitary work. The 2, 4-D herbicides are used in agriculture in the form of liquid aerosols and dust, while under actual working conditions they are present as dust. They should therefore be sampled on FPP-15 filters placed in metal cartridges, by means of electrical aspirators. It is recommended that the air for sampling 2, 4-D herbicides be drawn up at a rate of 10 l/min. This was tested under working conditions and found to be the optimum rate.

D-8671

Lauer, Otto
THE REPRODUCIBILITY OF ANALYSIS SIEVING IN THE FINE RANGE. STAUB (English translation), 27(9):13-17, Sept. 1967. 5 refs.
CFSTI: TT 67-51408/9

The reproducibility of particle size determinations of industrial dust by sieve analysis was investigated. The various factors investigated were: a) the type of screening system (air jet screening, screening on the flat screen, hand screening, wet and dry); b) various screening fabrics (40 and 75 μ); c) different sample weights (5, 20, 50 g); d) screens of different accuracy, namely the normal 40 μ fabric screen corresponding to DIN 4188, and the 45 μ microprecision screen; e) products of different fineness in the range of approximately 1 up to 98 percent residue on the 40 or 75 μ screen. Limestone ground in a pinmill or comminuted in a screening mill was the test material. In most cases the tolerance limit of 1 percent can be maintained for two successive analyses (for screenings in the range below 75 μ). Under certain conditions (i.e., when R is greater than 50 percent, or with an unfavorable screening system) greater deviations, namely up to 3 percent, are possible. However, the probability for the occurrence of these maximum deviations is less than 1 percent. Furthermore, it is possible - at least for wet screening and the air jet screen - to use larger samples. This further narrows the tolerance limits. For screen residues of an order of magnitude of 1 percent the tolerance limits can be lowered, for the air jet screen or wet hand screening, e.g., 0.2 percent. Tests have clearly shown that for screens with a mesh below 50 μ and fine products with less than 50 percent residue, wet hand screening and the air jet are superior to the flat screen and to dry hand screening. For very fine products (i.e., limestone with less than 15 percent residue) hand screening is time consuming to a degree no longer justifiable. With decreasing fineness of the material and coarser screen fabrics the differences between the various systems are gradually obliterated. With a 75 μ test screen, for instance, only small differences in reproducibility were discernible between hand screening and air jet screening, when screening products with R greater than 50 percent. In general, it can be stated that scattering in test screening can be held to relatively narrow limits, as long as the same fabric is used for analysis.

D-8672

Baum, Fritz and Inge Reichardt
MEASURING ERRORS OCCURRING DURING DETERMINATION OF THE DUST CONTENT IN WASTE GASES BY ADSORPTION OF TRIOXIDE ON MEASURING FILTERS. STAUB (English translation), 27(9):18-22, Sept. 1967. 4 refs.
CFSTI: TT 67-51408/9

The measurement of solid matter concentration in waste gas by means of fibre filters is adversely affected by SO_2 adsorption. The amounts (by weight) of SO_3 and solid matter present in waste gas are frequently of the same order of magnitude. About one to three tenths of the amount of SO_3 flowing through the filter is absorbed in cellulose filters. This amount appears to be higher in the case of glass-fibre filters. In cellulose filters, sulphuric acid removes water from cellulose, reducing the weight of the filter. This reduction is many times higher than the adsorbed amount of SO_3 as long as the temperature during filter drying or during measuring exceeds 105°C. (Authors' summary)

D-8673
Kampf, Wolfgang-Dietrich and Bernhard Schmidt
DETERMINING DUST PRECIPITATION BY MEANS OF TRANSPARENT ADHESIVE SURFACES. STAUB (English translation), 27(9):22-27, Sept. 1967. 10 refs.
CFSTI: TT 67-51408/9

A new method for measuring dust fall, using transparent plastic trays, which permits larger amounts of dust to be collected than on foils is described. In addition, optical evaluation is possible which eliminates adhesion losses as a source of error. Extinction values for dust fall measured by a photometer show, in the case of sufficiently long exposure time, a relationship to dust weight which is proved statistically. There is no reliable correlation for short exposure time. (Authors' summary, modified)

D-8773

Samosvat, L. S. and N. I. Verblyudova
THE SPECTROPHOTOMETRIC DETERMINATION OF XYLENE AND ITS ISOMERS IN AIR. [Spektrofotometricheskii metod opredeleniya ksilola i ego izomerov v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):223-226, July-Sept. 1967. 5 refs.
CFSTI: TT 67-51409/3

The colorimetric method of determining xylene in air is unsuitable for analysis of the ortho- and para-isomers and yields low results when a mixture of the isomers is determined from a calibration curve based on the commercial mixture. By means of the spectrophotometric method the xylene isomers can be determined with sufficient accuracy at λ equals 265 mμ. The sensitivity is 10 μg/ml. The determination is interfered with by substances absorbing in the region λ equals 265 mμ in isopropyl alcohol.

D-8775

Klisenko, M. A., M. V. Pis'mennaya, L. P. Novitskaya, and N. M. Brodskaya
THE DETERMINATION OF PHTHALOPHOS AND PHOZALON IN AIR. [Opredelenie ftalofosa i fozalona v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):232-236, July-Sept. 1967. 2 refs.
CFSTI: TT 67-51409/3

The method for the determination of phozalon based on alkaline hydrolysis of the preparation to diethyldithiophosphoric acid, which produces a complex yellow compound with copper salts, is unsuitable for the analysis of microamounts of this rodenticide in air. Phozalon and chemically pure phthalophos can be determined at λ max equals 237 and 284 mμ for phozalon and λ max equals 294 mμ for phthalopos. The sensitivity is 3 μg. Colorimetric determination from "total phosphorus" can be used for phthalophos as for all organophosphorus substances, but it is somewhat time-consuming. Its sensitivity is 0.005 mg phthalophos. Colorimetric determination of phthalophos and phozalon based on acid hydrolysis of the preparation with the liberation of formaldehyde which then reacts with chromotropic acid, is specific for toxic chemicals used in agriculture that hydrolyze with the production of formaldehyde. The sensitivity is 0.005 mg in a colorimetric volume of 5 ml. Thin-layer chromatography can be used for the determination of phthalophos and phozalon in air. The sensitivity is 0.0005 mg. The method is very simple and specific for each preparation.

D-8776

Gusarov, I. I., V. I. Abramov, and Z. G. Ivanov
A METHOD FOR THE DETERMINATION OF RADON IN EXHALED AIR. [Metod opredeleniya soderzhaniya radona v vydykhaemom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):237-243, July-Sept. 1967. 7 refs.
CFSTI: TT 67-51409/3

The technical conditions for the determination of small radon concentrations in air exhaled by human subjects at a given sensitivity ($2 \cdot 10^{-15}$ curie) and with an accuracy suitable for dosimetric purposes (±20%) was studied. The radon content of the investigated samples was measured in a scintillation emanation chamber, by the preliminary deposition of the daughter products of radon from the air onto the surface of a measuring transducer built into one of the walls of the chamber. In addition to specially-designed counters and emanation chambers, standard radiometric apparatus that is available in any radiological laboratory was used. The sensitivity of the method was further enhanced by adsorption of radon from the air by the activated carbon. This technique makes it possible to extract radon from large volumes of air (100 - 1,000 liters), followed by its transfer to a 0.5 - liter emanation chamber. Under these conditions, it is easy to determine radon concentrations down to $1 \cdot 10^{-15}$ curie/l. The method has been tested in practice in work carried out in Bulgaria on the determination of the radon content in exhaled air. Some of the tests were carried out on children aged 11 - 14 living in a rural area with a normal level of natural background radioactivity. In 10 measurements, the radon content in the exhaled air was found to vary between 2 and $3.2 \cdot 10^{-15}$ curie/l in five children and was below $2 \cdot 10^{-15}$ curie/l in five others (i.e., below the sensitivity of our apparatus).

D-8778

Baron, L. I.
A NEW BRITISH DEVICE FOR THE GRAVIMETRIC DETERMINATION OF DUST IN THE AIR OF MINES. [Novyi angliiskii pribor dlya vesovogo opredeleniya zapylennosti rudnichnogo vozdukha.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.). 32(7-9):260-262, July-Sept. 1967.
CFSTI: TT 67-51409/3

The new device possesses a dust precipitator in front of the filter for the preliminary precipitation of large dust particles which, because of their size, are unable to enter the lungs during respiration. The device is switched on for an entire shift, working at the constant volumetric air sampling rate of 2.5 l/min. The total dust content in the air drawn through the device is determined by weighing the filter at the laboratory within 0.01 mg. If it is desired to make separate determinations for rock and coal dusts, the filter can be heated to 500° for 2 hr (the coal particles thus being combusted). Experiments over a period of 9 months showed the mean accuracy of this new device to be plus or minus 8 percent. The gravimetric determination of air business is now being much more extensively used outside the U.S.S.R., than hitherto. It is now in use in England, the U.S.A., France, East Germany and elsewhere. The gravimetric method is recognized as being a much better indication of the hazard presented by dust content in the air. At the present time maximum permissible concentrations in gravimetric indexes (mg/m^3) are being proposed in the U.S.A. for certain kinds of mineral dust.

D-8783

Korotkov, P. A., Yu. P. Tsyashchenko, and N. Ya. Yanysheva
ISOLATION AND DETERMINATION OF 1,12-BENZPERYLENE. [K voprosu o vydelenii i kolichestvennom opredelenii 1,12-benzperilena.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):380-383, July-Sept. 1967. 2 refs.
CFSTI: TT 67-51409/3

The fluorescence spectra of 1,12-benzperylene and

3, 4-benzpyrene were recorded with a photoelectric spectrophotometer. The limiting concentration of 1, 12-benzperylene determinable by the proposed method is 0. 1 - 0. 05 μg/ml, and the analytical error is within 10 percent. It should be emphasized that the concentration of 3, 4-benzpyrene added to the solution should not exceed 0. 1 - 0. 05 μg/ml since its fluorescence is one order of magnitude more intense than that of 1. 12-benzperylene. A method for the separation of 3, 4-benzpyrene and 1, 12-benzperylene by paper chromatography was devised. The preliminary identification of substances corresponding to the different zones in the chromatogram and the identification of these zones on the paper strip were performed visually from the color of the fluorescence zones under ultraviolet illumination provided by a mercury lamp PRK-2. For final identification the chromatogram is cut into pieces in accordance with the fluorescence zones and every zone is extracted separately with hexane; then the individually extracted components are identified from the spectrograms of the low-temperature fluorescence of their solid solutions. The method was tested by chromatographic determination of a standard mixture of pure 3, 4-benzpyrene, 1, 12-benzperylene and 9, 10-dimethyl-1, 2-benzanthracene dissolved in hexane, the concentration of every component being 0. 5 μg.

D-9273

Aurand, Karl and Julius Bosch
RECORDING COUNTER FOR THE CONTINUOUS DETERMINATION OF THE CONCENTRATION OF PULVERULENT AIR POLLUTANTS. STAUB (English translation), 27(10): 21-24, Oct. 1967. 8 refs.
CFSTI: TT 67-51408/10

A recording dust counter has been developed on the basis of practical experience with beta-rays weight per unit area gauges. With the help of beta-absorption the dust content of air can be determined continuously in mg/m^3. The sensitivity is so high that dust immission values for clean air can be measured. The instrument can operate for many months without any supervision and is also suitable for dust content measurements in a working place. (Authors' summary)

D-9274

Polydorova, Marie
DETERMINING THE CONCENTRATION OF ULTRAFINE AEROSOL PARTICLES BY MEANS OF THE THERMAL PRECIPITATOR. STAUB (English translation), 27(10):24-28, Oct. 1967. 6 refs.
CFSTI: TT 67-51408/10

A method for determining concentration of fine aerosol particles of an order of 10^{-2} μ is proposed for the thermal precipitator. By means of a graphic extrapolation method the number of particles precipitated in the trace and also the trace width are determined approximately by this method. (Author's summary)

D-9642

Avy, A. P., M. Benarie, and F. Hartogensis
COMPARISON OF DUST SAMPLERS AND SAMPLING METHODS. STAUB (English translation), 27(11):1-16, Nov. 1967. 20 refs.
CFSTI: TT 67-51408/11

Earlier comparative measurements have shown that there are no essential differences between gravimetric dust concentrations determined by different measuring methods. In contrast to this there was a great disparity between the results of particle number determinations; it appeared that this disparity was associated with the visibility limit of the individual test method. Further comparative measurements were, therefore, carried out in a steelwork and in a dust sphere of 2000 m^3. The results obtained by any instrument used in the dust sphere may be converted for any other instrument. Standard deviation in this case is 15 percent. It was found that the same conversion could in general also be used for measurements in the steelwork. Since, as is well known, dust conditions in the industry are subject to considerable random fluctuations the conversion may only be used for mean values or long-term values, but not for short-time values. (Authors' summary, modified)

D-9643

Schönauer, Gerhard
THE ELECTRON-MICROSCOPIC DETERMINATION OF DROPLET-SIZE DISTRIBUTION IN OILMISTS USING THE FLATTENING FACTOR. STAUB (English translation), 27(11):23-27, Nov. 1967. 7 refs.
CFSTI: TT 67-51408/11

A method for the determination of droplet size distribution in artificial mists which permits droplets of a size up to 0. 01 μ to be determined is described. For this purpose droplets were precipitated on tylose and then they penetrated into tylose hollows softened by a steam treatment. By shading the dry hollows in a vacuum an image of flattened droplets is obtained which can be measured under the electron microscope. If the flattening factor is known, this gives the original size of droplets. By means of this method, droplet size distributions of the exhaust aerosol of an internal-combustion engine, and of the aerosol of a spray nozzle were determined. (Author's summary, modified)

D-9644

Lahmann, Erdwin
EVALUATION OF CONTINUOUS AIR-QUALITY MEASUREMENTS BY POINT RECORDING. STAUB (English translation), 27(11):27-29, Nov. 1967. 6 refs.
CFSTI: TT 67-51408/11

Continuous determinations of CO concentration at a busy traffic artery show that immissions may be very well characterized if the average half hour values, used as the basic units, are obtained as an average of 5 random-test measuring points and not by integration. An infra-red analyzer was continuously operated with an attached six-color chopper-bar recorder. Air was aspirated continuously from six measuring points towards a gas distributor which, for turns of one minute each, fed the sampled air from these hoses to the measuring instrument. On the recorder stripchart one CO concentration value was printed every minute as a dot in one of six different colors. Thus, each measuring point yielded one dot every six minutes. As individual values for further evaluation were used, mean values formed from five "measuring dots" of each half-hour for each of the six sampling points. The simplified principle of continuous air analysis by including spot sampling points cannot only be used to obtain measured data of the identical pollutant at different measuring points, but also in the simultaneous determination of different pollutants in air. At measuring points with slight and short-term fluctuations of pollutant concentrations even less than 5 dots per half hour would suffice to characterize air quality.

E-3916

Hasenclever, Dieter
WHAT MAY BE DEMANDED OF HIGH EFFICIENCY FILTERS? STAUB (English translation), 26(10):22-26, Oct. 1966. 7 refs.

The use of high-efficiency filters and problems associated with their operation are discussed. A survey of results obtained in Germany after testing high-efficiency mechanical filters (absolute filters) for a period of three years is presented. According to these results 63.6 percent of the fibre filters subjected to tests satisfied the requirements. The permeability of large filters in nuclear plants can, however, be several times higher than that of a single filter element or of the filter material used. This is due to the fact that in many cases there are leaks between the filter elements and filter housing. Methods are, therefore, given for reducing these leaks, which frequently cannot be controlled, by essentially shortening the sealing line. (Author's summary, modified)

E-3917

Gilbert, Humphrey
FILTRATION PROBLEMS IN THE A.E.C. PROGRAM. STAUB (English translation), 26(10):27-33, Oct. 1966. 9 refs.

Large air-cleaning plants of the U.S. Atomic Energy Program are described and illustrated by photographs. Practical experience of the A.E.C. gained in other nuclear and nonnuclear air-cleaning plants requiring high-efficiency filters, is discussed in detail. The solution of existing problems illustrates current investigations undertaken by the A.E.C. plant testing and research work for filter improvement. The asbestos-cellulose filter and glass fibre filter are compared with regard to their efficiency and cost in the U.S.A. (Author's summary)

E-4066

Tsipenyuk, M. Kh. and Yu. E. Tsipenyuk
PURIFICATION OF GASES GENERATED IN PHTHALIC ANHYDRIDE PRODUCTION. Gigiena i Sanit., 28(1):66-68, Jan. 1963. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 9-12, 1966.
CFSTI: TT 66-61429

All technological processes used at present in the production of phthalic anhydride are based on the principle of napthalene and at times o-xylol oxidation by air oxygen catalytically. Under such production conditions the tail gases contain numerous admixtures after the phthalic anhydride concentration even under the most favorable waste gas trapping conditions. These admixtures pollute the atmospheric air, and can unfavorably affect man, animals, and plants. Results of this investigation indicated that gases generated in the production of phthalic anhydride can be purified most efficiently by foam scrubbers. Their use in all departments of plants engaged in the production of phthalic anhydride is here recommended.

E-4067

Kossovskii, E. O.
SANITIZATION OF IRON PYRITES GRINDING AT THE M. B. FRUNZE SULFURIC ACID PLANT. Gigiena i Sanit., 28(1):77-79, Jan. 1963. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 12-15, 1966.
CFSTI: TT 66-61429

The iron pyrite grinding department at the M. F. Frunze sulfuric acid plant was an intense source of fine air-suspended dust which was coming from the transportation, unloading, grinding, and loading of the ground ore onto the small transfer cars. The entire pyrite grinding process was accomplished in an inclosed brick building. Fine dust was intensely liberated into the surrounding air at each step of the procedure. The density of the air-suspended pyrite dust was inversely proportional to the moisture content of the raw ore, but the temperature of the air generally reduced the initial moisture of the raw pyrite by 65-70 percent, and under the prevailing ore grinding conditions it was not possible to raise the moisture content of the material artificially. Attempts to sanitize the working conditions had to be limited to encasing points of dust generation and to establish a suitable system of leak-proof ventilation. Before the sanitary improvements in the process of iron pyrites grinding were instituted the density of the generated and air suspended pyrite dust was great and constituted a serious sanitary problem. The density of the iron pyrite dust in the air surrounding the process was to a degree inversely proportional to the moisture content in the raw ore. The sanitary improvements consisted basically in leak-proof encasing of strategic dust generating production points and in instituting an arterial ventilation system.

E-4068

Belaga, M. B. and P. N. Maistruk
EXPERIMENTAL SANITARY IMPROVEMENT OF WORKING CONDITION IN THE YA. M. SERDLOV SUPERPHOSPHATE PLANT. Gigiena i Sanit., 28(1):80-82, Jan. 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 15-18, 1966.
CFSTI: TT 66-61429

The most significant sanitary measures instituted in the phosphate plant's basic production departments to improve sanitary working conditions are the following: The apatite unloading from the railroad gondolas and loading onto small delivery cars was changed from manual to electric crane shovels or buckets, which lowered the stockyard air dust density by 80 to 90 percent. Manual cleaning of the bunker grates, from which the apatite was picked up by the elevator, was replaced by automatically operated electric scrapers, which also lowered the air dust density by 80 to 90 percent. The acid diluting, dosing, and temperature regulating in the operating section had been automated, the conduits made leakproof, and the exhaust ventilation was operated at 30 mm of mercury or below; all this lowered the department's air dust density to 17 - 12 percent of the original. At the silico-fluoride department, the use of coal for drying-oven heating was replaced by natural gas, and the oven had been heat insulated, which eliminated the presence of coal dust in the air and lowered the intensity of heat radiation by the drying ovens from 0.5 to 0.2 cal/cm^2/min. At the department of granulated superphosphate, the following improvements have been instituted: natural gas instead of coal is burned in heating the drying drums, a two-step air purification from fluorine and superphosphate dust has been installed, all ventilation conduits have been examined and made absolutely leak-proof, etc. The tail gases discharged into the atmosphere now contain only 0.18 g/m^3 of dust and 0.002 g/m^3 of fluorine. In conclusion, study of the plant's personnel medical and work records indicated that due to the above described system of sanitary, therapeutic, general medical and prophylactic services the rate of morbidity and loss in work days have been steadily declining in this plant.

E-4069

Timokhin, D. I. and V. V. Filipov
MINE DUST ABATEMENT BY PRELIMINARY FORCED COAL BED MOISTENING. Gigiena i Sanit., 28(1):108-110, Jan. 1963. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 25-28, 1966.
CFSTI: TT 66-61429

Attempts were to evaluate the effectiveness of forcing water into coal beds aimed at lowering the dust density of underground mining spaces. A study was made of the dust density in the air of mines having gently or sharpiy sloping coal strata of 0.7 - 0.8 meters thick, which generally consisted of anthracite or coke coal. The study was conducted in mines belonging to Rostovugol and Vorkutugol combines where mining was done by the usual mining method and by force-wetting the coal strata first. Effectiveness of preliminary force-wetting as a method of dust abatement was studied and evaluated also at "Donbass" and LOD-1 combines and also at mines Yogozapadnaya No. 1 (faces 101 and 406) and Kapital'naya No. 1 (face No. 7), where the pneumatic hammer mining method was used. Water was forced between the coal faces with the aid of apparatus RPP-2 under pressure of 60-80 atmospheres through holes 1.8 to 2.0 meters deep drilled in the coal strata 3 to 4 meters apart perpendicular to the slope of the coal face. Results of the investigation indicated that the procedure of forcing water into the coal bed at the time of the mining combine operation lowered the concentration of dust suspended in the air at the working location to 16 percent, which was still considered high and required additional or different means for further and more efficient dust abatement. The data presented emphasize the need of applying a complex of sanitary means for the abatement of mine air dust where coal is mined by pneumatic drilling, or by coal digging combines; the central or basic component of such a complex must be coal strata wetting by water forcing. This should be done not only at chosen strategic, but at all points of coal mining.

E-4393

Masuda, S.
STATISTICAL OBSERVATIONS ON THE EFFICIENCY OF ELECTROSTATIC PRECIPITATORS. STAUB (English translation), 26(11):6-11, Nov. 1966. 8 refs.

In the design of an electrostatic precipitator, it is not always possible to take an adequate safety factor, owing to the economical reasons. In such a case, the cleaning efficiency of the precipitator cannot be guaranteed in the deterministic sense, but only in the probabilistic point of view, with the expected value of the cleaning efficiency and the probability that the cleaning efficiency exceeds a threshold value requested. In this paper, the general theory of the statistical design and its application to the electrostatic precipitation were presented. A design chart and some of its applications were also given for the case of an electrostatic precipitator. (Author's summary)

E-4394

Darby, K. and D. O. Heinrich
CONDITIONING OF BOILER FLUE GASES FOR IMPROVING EFFICIENCY OF ELECTROFILTERS. STAUB (English translation), 26(11):12-17, Nov. 1966. 2 refs.

Several operating conditions of electrofilters which operate with a reduced effective power input can be substantially improved by the injection of small quantities of SO_3 into the flue gas. Measurements on full scale plants have shown that the effective migration velocities have increased by up to 85 percent. An SO_3 conditioning plant, now working for more than two years, has proved that there is no increase in sulphur emission and no additional corrosion problem. (Authors' summary)

E-4395

Quitter, V.
DERIVING A FUNCTION TO PREDICT SEPARATION EFFICIENCY OF DYNAMIC WET SCRUBBERS. STAUB (English translation), 26(11):17-23, Nov. 1966. 8 refs.

The aim was to permit exact separation efficiency calculations based on dust characteristics. Efficiency measurements were previously carried out in an experimental wet-separation plant. It was found that separation efficiency is influenced by moisture content, fineness of droplets, particle size and density of dust, wetting method and separation method. A separation formula is derived from the measuring results according to the statistical method.

E-4396

Engels, L. H.
FEED GAS CLEANING IN COKE-OVEN LARRY CARS. STAUB (English translation), 26(11):23-31, Nov. 1966. 6 refs.

The problem of feed gas cleaning in coking plants is outlined. After a description of technological processes occurring in coal carbonization, various methods for gas removal and gas cleaning are shown, and especially difficult operating conditions and the problem of output measurements to assess the efficiency of the method used are also discussed. Factors influencing the efficiency of known dust cleaning methods (size and design of ovens, type and composition of coal etc.), and the measuring results available are considered. Finally, the costs of investment, maintenance and operation are given. (Author's summary)

E-4397

Storch, O.
A NEW VENTURI SCRUBBER TO SEPARATE DUST PARTICLES LESS THAN 1 MICRON, ESPECIALLY OF BROWN SMOKE. STAUB (English translation), 26(11):32-34, Nov. 1966.

A new Venturi separator and its test results are described. It is particularly suitable for separating dust of particle size less than 1 micron occurring in metallurgical works. The separator design is very simple and all units of this type have a constant separation efficiency regardless of size. The water required can have a solid content up to 100 g/l which considerably decreases the cost of sludge treatment. (Author's summary, modified)

E-4399

Pistor, R.
SOME REASONS FOR UNSATISFACTORY OPERATION OF DUST-REMOVAL PLANTS. STAUB (English translation), 26(11):41-44, Nov. 1966.

Investigations have been carried out into the causes of unsatisfactory operation of dust removal plants. It is shown that all aspects of planning, design, production and delivery to a plant must be carefully evaluated, and that, in the first place, the operating conditions must be clearly determined. It is explained by practical examples what difficulties can still occur and how they can be eliminated. (Author's summary)

E-4400

Kuhnen, G.
DUST CONTROL DURING QUARRYING AND WORKING OF STONE. STAUB (English translation), 26(11):44-45, Nov. 1966. 1 ref.

An introduction to a motion picture is presented. The film shows particularly interesting and effective dust control devices during normal operation. Several scenes contrast effective dust control with no operative control.

E-4401

Getsberger, K.
STONEWORKING WITH PNEUMATIC TOOLS AND DUST CONTROL. STAUB (English translation), 26(11):45-50, Nov. 1966. 4 refs.

The introduction of pneumatic tools for stoneworking resulted in a considerable increase in the dust content of air in the breathing range of the operator. Workers in the stone working industry are thus exposed, to a large extent, according to the silica content of the material used, to silicosis hazards. Instruments are described which have been developed in the past years for determination of dust in places in which it is produced, and measures are discussed which could be taken to protect the worker against silicosis. The discussion is illustrated with diagrams, and it is shown by examples that it is possible to solve the problem of dust abatement in stoneworking. (Author's summary)

E-4402

Pott, F. Ph.
TESTING THE TIGHTNESS OF FILTER SEATS. STAUB (English translation), 26(11):50-53, Nov. 1966.

A procedure is described to measure easily the tightness of the filter seats for filter units with exchangeable high-efficiency filters. All flow through the filter is blocked. A fixed volume on the intake side of the filter is supplied with gas to maintain a constant pressure. The flow of this gas is measured and this corresponds to the leakage rate. Some of the results obtained by this method are shown.

E-4581

Khanin, I. M., V. I. Yakovlev, and M. B. Kartsynel
A SPRAY-TYPE BENZOLE SCRUBBER WITH RADIALLY-SLOTTED GAS DISTRIBUTORS. Translated from Russian. Coke Chem. (U.S.S.R.), Vol. 1, p. 30-35, 1965. 10 refs.

The aim was to present the results of a study of the aerodynamics of a new stage-type benzole scrubber with radially-slotted gas distributors. It has been found that: 1. The radially-slotted distributors distribute the stream quite evenly across the scrubber, irrespective of how the gas is supplied (radially alpha = 0°, along a secant alpha = 35°, or tangentially alpha = 90°); 2. Increasing the number of plates in the top and bottom rows of the distributors from 8 to 16 does not affect the distribution of the gas; 3. The gas distribution through the scrubber is impaired by increasing the depth of the slots between the two rows of plates. Although reducing the depth of the slots improves the distribution, it also increases the resistance of the scrubber; 4. The distribution of the gas improves noticeably as it passes through the distributors. There is no doubt that recovery improves as the number of distributors (and, consequently, the number of stages as well) increases; 5. Increasing the flow rate of the gas does not substantially affect the pattern of its distribution across the scrubber. However, the resultant increased turbulence of the gas jets emerging from the distributor slots improves the absorption; and 6. The resistance of a commercial stage-type scrubber with a gas throughput of 84670 m^3/h would be 53 mm water gauge. (Authors' conclusions, modified)

E-4634

Varshavskii, T. P., A. M. Denisov, L. E. Zlatin, and K. V. Zolotarev
SMOKELESS CHARGING OF COKE OVENS. Translated from Russian. Coke Chem. (U.S.S.R.), No. 6, p. 26-31, 1965. 8 refs.

A pilot-commercial smokeless charging plant has been built on No. 1 battery at the Kemerovo Coke and Chemical Works along the lines of those at VUKhIN and the Magnitogorsk Integrated Iron and Steel Works. A new smokeless oven charging system has been devised and introduced on the No. 1 battery at the Kemerovo Coke and Chemical Works based on separate consecutive emptying of the charging-car hoppers (4, 3, 2, and 1) with suction of the charging gases only into the coke side collecting main. The possibility of the saleable tar being contaminated with ash or heavy tar products has been eliminated. 4.0 tons/day of high-ash tar was obtained from the coke side collecting main. The nitric oxide content of the raw gas from No. 1 battery is 16.5 cc/cu meter. Accordingly it is vital to solve the problem of how to remove the nitric oxide from the charging gases or how to isolate and utilize them without purification. The satisfactory operating results of the plant enable this system to be recommended for works which do not supply gas to nitrogenous fertilizer undertakings.

E-4656

Altybaev, M. and V. V. Streltsov.
REMOVAL OF SULPHUR COMPOUNDS FROM GASEOUS FUELS. Translated from Russian. Coke Chem. (U.S.S.R.), No. 8, p. 43-45, 1966. 12 refs.

The effect of hydrogen in increasing the removal of H_2S by iron oxide and its influence on the final composition of the spent oxide is reported. The relation between the maximum sulfur absorption capacity of the oxide, particle diameter, and temperature is given. The maximum sulfur capacity at 400°C was 20.5 percent for the 0.15 to 0.25 mm size oxide and for the 0.25 to 0.42 mm size, maximum sulfur capacity was 16.0 percent. The 350-400°C range can be taken as the optimum temperature for purifying gases containing hydrogen in amounts of 7 to 8 percent. At 350 to 400°C the removal of the H_2S remains at the maximum until 16 percent has accumulated on the oxide. When the absorption was done in three stages, the extent of the purification was not less than 99.98 percent. There was a negligible entrainment of oxide from the fluidized bed.

E-4813

Kiyoura, R.
THE SEPARATION OF SULFUR DIOXIDE FROM HOT FLUE GASES. STAUB (English translation), 26(12):16-18, Dec. 1966. 2 refs. (Also published as "Studies on the Removal of Sulfur Dioxide from Hot Flue Gases to Prevent Air Pollution." J. Air Pollution Control Assoc., 16(9): 488-489, Sept. 1966.)

A dry method for separating SO_2 from hot flue gases is reported. The process (Kiyoura T. I. T. process) oxidizes the sulfur dioxide of the waste gases in the presence of vanadium pentoxide at a temperature of 380 to 450°C to form sulfur trioxide. A limited quantity of water vapor contained in the flue gas reacts with sulfur trioxide to form sulfuric acid. Ammonia is then introduced into the gaseous mixture at a temperature not below the dew point of the sulfuric acid in the waste gas. The temperature facilitates the formation of a particle size (of the ammonium sulfates) suitable for separation in an electrostatic precipitator, cyclone or other filter. Estimated operating costs of the process are quoted.

E-4817

Drees, W.
INVESTIGATING THE USE OF SURFACE-ACTIVE SUBSTANCES IN DUST CONTROL BY WATER. STAUB (English translation), 26(12):31-36, Dec. 1966. 11 refs.

It has been investigated experimentally whether anion-active "Tensid" solutions have a positive effect on mineral dusts from the point of view of suspended dust abatement. Adsorption tests, boundary angle measurements and determination of drop separation efficiency by the Taubman apparatus are reported. The results show that, in the case of quartz, neutral solutions do not essentially differ, as regards separation efficiency, from distilled water. In contrast to this, acid or basic solutions increase the separation.

E-5046

Manusadzhtants, Zh. and L. Stepanov
REDUCTION OF ATMOSPHERIC POLLUTION WITH CAR ENGINE FUMES. [Snizhenie zagryazheniya atmosfernogo vozdukha otrabotavshimi gazami.] Avtomob. Transp., 41(5):19-21, 1963. Translated from Russian. Russian Translating Programme, RTS-2618, 9p., Aug. 1964.
CFSTI: TT 64-23518

The carbon monoxide content of exhaust as affected by the condition and adjustment of the carburetor was investigated. The tests were carried out on cars fitted with the ZIL-120 and GAZ-51 engines, both idling and on the road at different speeds. The fumes were analysed for carbon monoxide under laboratory conditions, using a Fischer Orsat gas analyser. Comparative exhaust analyses were made with the two test engines (ZIL-120 and GAZ-51) fitted with different carburetors. The carburetors were fitted one after the other to each of the two engines, a series of K-82 carburetors on the ZIL-120 engine, and a series of type K-22G on the GAZ-51. The fuel was grade A-66 petrol, all from the one batch. The carbon monoxide content of exhaust from an engine running under given conditions varies according to the carburetor fitted and is a function solely of the condition and adjustment of the carburetor. Major variations can occur in the CO content of the exhaust at low speeds (600 rev/min) or at high idling speeds (2000 - 2400 rev/min). Similar comparative tests were also carried out on the CO content of the exhaust from a GAZ-51 engine fitted with a series of K-22G carburetors, both idling and running at a steady speed along a horizontal road. If the carburetor condition is such that at steady road speeds above 30 km/h the CO content of the fumes is at a minimum, then it will remain relatively low when the engine is idled at high speeds (1400 - 2000 rev/min). The Moscow car pools have made an examination of 39 ZIL-164 and 79 GAZ-51 cars. The CO content of the exhaust was determined with the engine idling at two steady speeds, namely 600 and 2200 rev/min of the crankshaft. Only 20-25 percent of the vehicles examined emitted exhaust with less than 2 percent CO when ticking over. At high idling speeds, only 50 percent of cars examined emitted exhaust with a low CO content (below 2 percent by volume). The remainder of the cars had either worn-out or incorrectly set carburetors, and emitted exhaust with up to 8 percent CO. On-the-spot carburetor adjustments reduced the CO content to 2 percent or less.

E-5118

Pallinger, J.
A NEW WET METHOD FOR SEPARATION OF VERY FINE DUST. STAUB 22(7):270-275, 1962. Translated from German by British Iron and Steel Industry Translation Service, No. BISI 3277.

The increasing use of oxygen in steelmaking demands gas cleaning methods adequate to meet clean air requirements. Experiments with a new wet scrubber are reported, in which pressure drop and water consumption are reduced to an economic level. In the new Venturi scrubber used there are two processes making a double scrubbing effect. The dust-laden gas in the first instance meets at medium velocity the water drops with approximately zero axial velocity and in the second instance, meets at maximum velocity the reflected curtain of small drops with axial velocity at least zero. In this manner, the washing water is used with maximum efficiency. With a dust concentration in the impure gas of 30.1 g/Ncu m (normal temperature and pressure) of dry gas, the following precipitation efficiencies were obtained: For pressure drops (mm water gauge) of 100, 500, 700, and 900 the total precipitation (percent) was, respectively 90.48, 99.44, 99.74, and 99.83. Comparable total separation efficiencies are obtained for many other difficult-to-separate very fine dusts, as for example, in cleaning the gases of electric-arc furnaces, both of open and closed design. The scrubber was also effective for cleaning the waste gas of a boiler plant with sulphite waste liquor combustion.

E-5219

Cardozo, R. L. and P. Dejonghe
THE REMOVAL OF GASEOUS CONTAMINANTS FROM AIR WITH A SORBANT INJECTION SYSTEM. Centre d'Etude de l'Energie Nucleaire, Bruxelles, Belgium. EURAEC-196, SR 2, 1961. 16p. (Presented at the Seventh International Air Cleaning Conference, Brookhaven National Lab., Upton, N. Y., Oct. 10-12, 1961.) Translated from French, Office of Technical Services, Dept. of Commerce, Washington, D. C., 13p.
CFSTI: TT 62-33189

A sorbant injection system can be used for cleaning gases from contaminants when low or intermediate decontamination factors are allowed, as in closed circuits. The sorbant injection system, in its simplest form, is composed of a pipe length with a sorbant feed system at the headend and a cyclone, to remove the sorbant from the gas stream, at the tail-end. Decontaminations of the order of 99 percent are easily obtainable. (Authors' summary, modified)

E-5278

Barth, Walter
CALCULATION AND LAYOUT OF CYCLONE SEPARATORS ON THE BASIS OF NEW INVESTIGATIONS. [Berechnung und Auslegung von Zyklonabscheidern auf Grund neuerer Untersuchungen.] Brennstoff-Waerme-Kraft, No. 8, p. 1-9, 1956. 15 refs. Translated from German. National Institutes of Health, Bethesda, Md., 38p., Aug. 12, 1958.

With the aid of simplified assumptions about the flow conditions in the cyclone separators, a calculation is developed which permits statements about the relationships between the pressure loss, efficiency of separation and the geometric dimensions of cyclone separators. With the aid of this mathematical method, conclusions are drawn on the most favorable layout of cyclone separators in regard to efficiency of separation and economy, and different types are recommended for various applications. An improvement of cyclone dust-removal devices can often be obtained by an appropriate layout. (Author's abstract, modified)

E-5373

Kachanak, Stefan and Zdenek Jona
KINETICS OF SULFUR DIOXIDE ADSORPTION ON ACTIVE CHARCOAL. Translated from Czech. Chemicky Prumysl, 11(3):127-129, 1961. 6 refs.

The rate of adsorption of sulfur dioxide on active carbon in concentrations and in velocity regions actually occurring in the purification of waste industrial gases was studied. The conclusion reached was that the adsorption process takes place fast enough, and that the adsorption equilibrium is reached in 15 to 20 min. From the point of view of the adsorption kinetics, industrial application of the investigated process is suitable. The influence of the concentration and of the flow velocity of the gases was evaluated, and at the same time the influence of outside diffusion upon the investigated process was proven.

E-5380

Knopp, H., E.-U. Joachim, and G. Baumann
THE INFLUENCE OF GASOLINE INJECTION ON THE EXHAUST GASES OF MOTOR VEHICLES. [Beeinflussung der Kraftfahrzeugabgase durch Benzineinspritzung.] Translated from German. Motortech. Z., 26(9):353-361, Sept. 1965 and Bosch Tech. Ber., 1(4):206-220, Sept. 1965. 9 refs.

The emission of carbon monoxide, hydrocarbons and oxides of nitrogen from various engines with intake-manifold fuel-injection systems, and in some cases from their carburetor equipped counterparts, was measured. Under steady running conditions, a fuel injection system offers advantages by making it possible to adopt the characteristic from point to point to obtain the most favorable exhaust conditions. This adoption is described for both a mechanically and an electronically controlled injection system. Fundamental advantages are obtained with a fuel-injection system under non-steady running conditions, during acceleration and on the overrun. A great influence of engine design on hydrocarbon emission is detectable. Gasoline intake manifold injection offers a sure way of meeting the current requirements of the California test of a CO content of 1.5 percent by volume. If the limit is going to be reduced to 1.0 percent as of 1970, as has been announced, then it would seem possible to stay within this value through additional efforts. As shown in the examples of the small and the large engine, it is possible to fulfill the current hydrocarbon requirements of the test, provided the engine design takes into account the demands made on the exhaust gas. The NO_2 emission behaves exactly in an opposite fashion to the CO and hydrocarbon emissions, because it is at a maximum when the other components reach minimum values. At the present state of our knowledge it is not possible to influence this through the mixture. It is fortunate that the percentage of nitrogen oxides at low partial load values of the California cycle is low. In principle it makes more sense to provide maximum combustion completion for the fuel in the combustion chambers, rather than to install afterburners. Injection offers the additional advantage of smaller fuel consumption and larger rotational momentum.

E-5521

Pirumov, A. I.
PRESENT DAY TECHNIQUE OF INDUSTRIAL DISCHARGE PURIFICATION FROM DUST. Chapter 1, Aerodynamic Principles of Inertia Separation. 71 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases No. 11, p. 1-9, 1965.
CFSTI: TT 65-61965

The theoretical physics of cyclone collectors is reviewed. Two significant variables are the particles' size and the resistance to movement which they encounter from the fluid.

E-5522

Pirumov, A. I.
CALCULATION OF CYCLONE SEPARATION CAPACITY. Chapter 2, Aerodynamic Principles of Inertia Separation. 71 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 11, p. 10-26, 1965.
CFSTI: TT 65-61965

The gravitational theory of cyclone separation; the P. N. Smukhin and P. A. Kouzov centrifugal theory; the Muhlrad-Davies formula; and the estimation of the dust catchers' efficiency are reviewed. Secondary cyclone flows, tangential velocities, vortices, radical velocities, and particle size are considered.

E-5523

Pirumov, A. I.
MECHANICAL ANALYSIS OF THE INTERACTION BETWEEN A PARTICLE AND THE MEDIUM. Chapter 3, Aerodynamic Principles of Inertia Separation. 71 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 11, p. 27-46, 1965.
CFSTI: TT 65-61965

Mathematical analyses are presented of: (1) Aerosol particle inertia resistance to the carry-away effect of a curvilinear stream; (2) differential equations of particle movement in a curvilinear flow; (3) the solution of the differential equation of particle movement; (4) separation of particles at the initial movement section; and (5) separation of particles beyond the initial section.

E-5524

Pirumov, A. I.
AERODYNAMIC EFFECT OF TRANSVERSE VELOCITY GRADIENT FLOWS ON BODIES CARRIED ALONG BY THEM. Chapter 4, Aerodynamic Principles of Inertia Separation. 71 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 11, p. 47-75, 1965.
CFSTI: TT 65-61965

The following are mathematically analyzed: (1) the applicability of Stokes' formula to the condition of ambient curvilinear flow around suspended bodies; (2) the Taylor theorem; (3) experimental studies of movements of solid bodies in a rotating system; (4) the Taylor effect; (5) a case of potential medium movement and effect of particle rotation on the flow; (6) resistance of a rotating particle; (7) adjoined vortex of a rotating particle; and (8) dust particle movement in a boundary layer.

E-5525

Pirumov, A. I.
SOME AERODYNAMIC CHARACTERISTICS OF CYCLONE APPARATUSES. Chapter 5, Aerodynamic Principles of Inertia Separation. 71 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 11, p. 76-104, 1965.
CFSTI: TT 65-61965

Mathematical analyses are presented of: (1) pressure distribution in cyclone apparatuses; (2) distribution of rotational velocities at the bottom of a cyclone apparatus; (3) effect of radical cyclone flow on the dust separation efficiency; (4) effect of turbulence on cyclone separation efficiency; and (5) effect of other hydrodynamic factors on cyclone separation efficiency.

E-5950

Sivintsev, Yu. V. and N. N. Khvostov
METHODS FOR THE CONTROL OF ATMOSPHERIC AIR POLLUTION WITH RADIOACTIVE AEROSOLS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VI.] V. A. Ryazanova (ed.). 9 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part I), p. 93-106, 1962.
CFSTI: TT 64-11574

Theoretical considerations, experimental investigations, and practical tests related to the control of radioactive aerosols of low specific activity are presented. Recommendations are given on the basis of the possibility of making statistically significant measurements of atmospheric air pollution with radioactive substances within the range of the recommended allowable radioactive concentration limits. A short discussion of the effect count rate and possibility of raising it as well as background count rate and methods for its lowering is included.

E-6302

Nikitin, V. S.
REMOVAL OF INJURIOUS ADMIXTURES FROM OPEN PITS WITH RECIRCULATORY VENTILATION. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR, p. 3-26, 1962. 7 refs.

The experimental studies on the process of removal and movement of injurious mixtures from open pits were carried out on a hydraulic model. These studies consisted in determinations of the concentration of a solution of black aniline dye at measuring points in the working parts of the model at which tubes 0.8 mm in diameter and 50 mm high were installed, making it possible to take samples in the middle portion at different depths of water stream in the model. The concentration of dye in the samples was determined with an FEK-M electrocolorimeter. The derived equations make possible prognosis of the state of the general atmosphere of an open pit for the recirculatory and recirculatory-direct flow systems of natural ventilation and the intensity of the sources liberating the gases and dust, both for the planning of the pit and during its operation according to the stages of the development of mine work. Moreover, the derived equations make it possible to select the most suitable means of controlling dust and gases which exist under the given specific conditions, to ensure normal atmospheric conditions, to ensure normal atmospheric conditions in open pits. Efficient means for dust and gas control in an open pit should be anticipated already in the planning stage. Every technical project for working deposits by the open quarrying method should include a special team dealing with atmospheric conditions for working safety. This section should calculate the amount of the necessary gas and dust-suppressing or collecting equipment, indicating its type and cost, as well as estimate the necessary service personnel and their wages.

E-6305

Skvortsov, A. N., V. V. Kudryashov, and V. G. Mukhin
FOAMS FOR DUST CONTROL AT SUB-ZERO TEMPERATURES. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR., p. 224-231, 1962. 10 refs.

The possibility is examined of combining compatible surfactants manufactured by U. S. S. R. industry with antifreezes for water such as NaCl, $CaCl_2$, and $Al_2(SO_4)_3$, compatibility being understood as the quality of resulting in a solution which does not separate into layers and does not produce precipitates. There were also grounds to assume that in addition to lowering the freezing temperatures of our foaming agents these salts would improve the stability of the foams. A low-cost foam-forming preparation was developed which consists of an aqueous solution of 1.2 percent azolyat B (sodium salt of polyalkyl benzene sulfonic acid) and 6-20 percent NaCl, the latter playing the part of stabilizer. The foaming agent makes possible the preparation of stable foam with a high volume factor at sub-zero temperatures (down to 16.5C). According to tests made in a mine at sub-zero temperatures, the foam prepared with the foaming agent developed by the authors of the present paper can be used for the fixing of coal dust.

E-6306

Kudryashov, V. V. and A. N. Skvortsov
OPTIMUM CONDITIONS FOR THE OPERATION OF SPRAY NOZZLES AT LOW TEMPERATURES. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR., p. 232-237. 1962. 6 refs.
CFSTI: TT 66-51043

The optimum conditions for the operation of nozzles were investigated under working conditions and the results were analyzed. The experiments were conducted in the "Kaierkan" mine of the Noril'sk Mining and Metallurgical Complex which mines coal seams in the permafrost zone. The temperature of coal and country rock is -4.5 degrees, the air temperature varying about zero. The same temperature is found also in the mined coal which is forwarded by the conveyors to the main haulage workings. Experiments conducted established a characteristic relationship between the efficiency of dust suppression and the opening conditions of the nozzle which sprays nonfreezing water solutions of common salt and azolyat B. The optimum conditions for the operation of the MakNII-type nozzle is at near-zero temperatures. An explanation was provided for the existence of optimum conditions for nozzle operation in the experiment carried out in the mine, based upon information on the operation of nozzles and the properties of drops of the atomized liquid. The analysis made it possible to formulate a hypothesis on superior dust-suppressing properties of brines in comparison with water owing to the lower evaporation rate for small droplets.

E-6307

Uskov, V. I.
TESTING OF AN ELECTROSTATIC FILTER. (In: Air Pollution in Mines - Theory, Hazards, and Control.) Translated from Russian. Akad. Nauk SSSR., p. 238-242, 1962.
CFSTI: TT 66-51043

An experimental electrostatic filter, was installed at the "Yuzhnaya" mine of the Berezovskii Mine Complex in the manway of the underground milling chamber at the 162 m level. The filter is designed for the purification of dusty air which is drawn from under the principal dust sources of crusher. The ventilation frame from the crusher was connected to centrifugal fan. Conical diffuser connected to the fan by a rubber hose was installed in the lower part of the manway and suspended from a wooden shelf. The shelf was coated with a clay solution as a sealer. The upper portion of the manway contained, in addition to the electrostatic filter, high-voltage equipment from X-ray unit installed on a horizontal concrete platform and consisting of a KUSA-180 control panel and high-voltage transformer of the type D-110 with full-wave rectification by means of four KR-110 tubes. The electrostatic filter was separated from the lower part of the manway by concrete partition. The air purified by the filter was fed to the crosscut of the cage shaft of the "Yuzhnyi" pit where it mixed with the jet of fresh air supplied to the eastern wing of the mine. The operating of the mine electrostatic filter was based on the principle of separate ionization. For the first time in the U.S.S.R., a stationary installation of an electrostatic filter was successfully employed in a mine for dust removal from air. The electric method of air purification is efficient, economical and can be used for the elimination of dust from the air of the principal ventilation flows entering the mine and in the underground milling chambers. An electric filter with separate ionization ensures the purification of air entering the mine to the extent required by sanitary standards.

E-6493

Mikheev, V. A. and G. S. Gubauidullin
AGGLOMERATING ROASTING OF LEAD CHARGES ON AN UP-DRAFT SINTERING MACHINE, WITH RECIRCULATION OF GASES AND THE USE OF OXYGEN. Translated from Russian. Soviet J. Non-Ferrous Metals, 4(4):26, April 1963.

The advantages of using agglomerated roasting of sulfidic lead concentrates on an up-draft sintering machine were outlined. Gas recirculation was used to explain the possibility of obtaining gases with increased sulfurous anhydride concentrations in the sintering machine and further use of these gases in the sulfuric acid industry. That possibility makes it possible to effect a substantial increase in agglomerating roasting efficiency, to eliminate atmospheric contamination with harmful gases and to effect a more complex extraction of valuable charge components.

E-6562

RESTRICTING DUST EMISSION FROM FORCED-DRAFT BOILER INSTALLATIONS, CAPACITY 10 TON/HR AND OVER, HARD-COAL FIRED WITH MECHANICAL GRATES. [Staubauswurfbegrenzung Dampfkessel über 10 t/h Leistung Steinkohlenfeuerungen mit Unterwind-Zonewanderrost.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2091, 27p., Nov. 1961. 16 refs.

The purposes of these specifications are to describe the parts of the installation in which dust occurs; to characterize the influences leading to the formation of dust; to point out measures for the selection of suitable dust-removal installations and their maintenance; and to establish guide lines for the restriction of dust emission by new installations. Centrifugal separators, electrostatic precipitators, and stacks are considered as means to minimize the ground level concentration of particulates.

E-6563

RESTRICTING DUST EMISSION FROM FORCED-DRAFT BOILER INSTALLATIONS, CAPACITY 30 TON/HR AND OVER, HARD COAL-DUST FIRED WITH DRY ASH REMOVAL. Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2092, 27p., Nov. 1961. 16 refs.

The occurrence and reduction of dust in steam-generating installations with a capacity of over 30 ton/hr. are reviewed. The purpose is to describe parts of the installation in which dust occurs; to characterize the influences leading to the formation of dust; to point out measures for the selection of suitable dust-removal installations and their maintenance; and to establish guide lines for the restriction of dust emission by new installations. Centrifugal separators, electrostatic precipitators, and stacks are considered as means to minimize the ground level concentration of particulates.

E-6564

RESTRICTING DUST EMISSION FROM FORCED-BOILER INSTALLATIONS, CAPACITY 30-600 TON/HR AND OVER, HARD COAL-DUST FIRED WITH LIQUID ASH REMOVAL. Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2093, 27p., Nov. 1961. 17 refs.

The occurrence and reduction of dust emission in steam generating installations with a capacity of 30-600 ton/hr and over are reviewed. The purpose is: to describe parts of the installation in which dust occurs; to characterize the influences leading to the formation of dust; to point out measures for the selection of suitable dust-removal installations and their maintenance; and to establish guide lines for the restriction of dust emission by new installations. Centrifugal separators, electrostatic precipitators, and stacks are considered as means to minimize the ground level concentration of particulates.

E-6565

DUST PREVENTION - CEMENT INDUSTRY. [Staubauswurfbegrenzung Zementindustrie.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2094, 56p., June 1961. 14 refs.

The VDI specifications of air purification are divided into the following groups: 1. Permissible concentration of dust or gas in air; 2. Calculation of the distribution of the dust and gas; 3. Prevention of emission; 4. Measuring techniques for dust and gas content. The present specifications concern the creation of fine dust in cement plants and give indications for its prevention. It is the task of the specifications to describe the equipment and installations creating such dust; to correct the influences which lead to the formation of such dust; to indicate the measures for reducing fine dust; to give suggestions for the selection and maintenance of suitable dust-removal installations; to determine conditions and tolerances for the limitation of permissible emission by new installations. The measures suggested in the specifications take into account the present state of technology.

E-6566

DUST EMISSION FROM INDUCED-DRAFT ORE-SINTERING INSTALLATIONS. Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2095, 17p., Jan. 1959. 12 refs.

This specification contains: (1) the technological measures for the reduction of dust production; (2) the technical possibilities for dust precipitation; and (3) suggestions for the restriction of dust emission. The aims were: to characterize the influences which create dust; to point out measures for the reduction of dust emission; to establish guide lines for permissible dust emission; and to determine the necessity for dust removal from flue gases and to give indications for the selection of suitable dust separators. Knowledge of the relation between emission and deposition is important for an objective evaluation of the dust level. The factors to be considered in specifying centrifugal separators, electrostatic precipitators, and stacks are reviewed.

E-6567

RESTRICTING DUST EMISSION FROM NATURAL-DRAFT STEAM GENERATORS, CAPACITY 25 TON/HR AND LESS, LIGNITE-FIRED WITH STATIONARY OR MECHANICAL GRATES. Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2098, 21p., July 1958. 13 refs.

This specification contains: (1) the technological measures for the reduction of dust content; (2) the technical possibilities for dust precipitation; and (3) a suggestion for the restriction of dust emission. The aims are: to characterize the influences which create dust; to point out measures for the reduction of dust emission; to establish guide lines for permissible dust emission; and to determine the necessity for dust removal from flue gases and to give indications for the selection of suitable dust removal installations. Knowledge of the relation between emission and deposition is important for an objective evaluation of the dust level. The factors to be considered in specifying centrifugal separators, settling chambers, and stacks are reviewed.

E-6568

RESTRICTING DUST EMISSION IN BLAST-FURNACE OPERATION. [Staubauswurf Eisenhüttenwerke Hochofen.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2099, 23p., Feb. 1959. 7 refs.

The aims are to characterize the influences which create dust; to point out measures for the reduction of dust emission; to establish guide lines for permissible dust emission; and to determine the necessity for dust removal from flue gases and to give indications for the selection of suitable dust separators. Knowledge of the relation between emission and deposition is important for an objective evaluation of the dust level. The factors to be considered in specifying cloth filters, mechanical dust separators, wet electrostatic precipitators, and stacks are reviewed.

E-6569

RESTRICTING DUST EMISSION FROM COPPER-ORE SMELTERS. [Staubauswurfbegrenzung Kupfererzhütten.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2101, 30p., Jan. 1960. 8 refs.

This specification treats the occurrence and reduction of dust emission in those units of copper-ore smelters which represent the principal sources of dust. The purposes are: to describe the installation creating dust; to characterize the influences leading to the creation of dust; to point out measures for the reduction of dust emission; to give indications on the selection of suitable dust-removal installations; and to establish guide lines on restricting permissible dust emission from new installations. The dust emitted from a copper-ore smelter represents a loss of valuable metal (copper, silver, gold). Consequently, the interest of copper-ore smelters in keeping these losses as low as possible is equally as great as the desire to guarantee purification of the air. The factors to be considered in specifying cloth filters, centrifugal separators, electrostatic precipitators, and stacks are reviewed.

E-6570

RESTRICTING EMISSION OF DUST FROM COPPER-SCRAP SMELTERS. [Staubauswurfbegrenzung Kupferschrotthütten.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2102, 18p., Jan. 1960. 6 refs.

This specification treats the occurrence and reduction of dust emission in those units of copper-scrap smelters which represent the principal sources of dust. The purposes are: to describe the installations creating dust; to characterize the influences leading to the creation of dust; to point out measures for the reduction of dust emission; to give indications on the selection of suitable dust-removal installations; and to establish guide lines on restricting permissible dust emission from new installations. The dust emitted from a copper-scrap smelter represents a loss of valuable metals (zinc, tin, lead, copper). Consequently, the interest of copper-scrap smelters in keeping these losses as low as possible is equally as great as the desire to guaranty purification of the air. The factors to be considered in selecting cloth filters are reviewed.

E-6576

RESTRICTING EMISSION OF HYDROGEN SULPHIDE AND OTHER SULPHUR-CONTAINING COMPOUNDS, EXCEPT SULPHUR DIOXIDE, FROM GAS GENERATORS IN COKE, GAS, AND COAL-CONSTITUENT PROCESSING PLANTS. [Gasauswurfbegrenzung Schwefelwasserstoff und andere schwefelhaltige Verbindungen ausser Schwefeldioxyd Kokereien und Gaswerke, Kohlenwertstoffbetriebe.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2109, 21p., May 1960.

In coke and gas plants, dust, tar, mist and gas are emitted during several production stages. This VDI Specification concerns the emission of hydrogen sulphide and other sulphur containing compounds not including sulphur dioxide, by coal-constituent processing plants. The essential points treated herein are the occurrence of hydrogen sulphide and other sulphur-containing compounds not including sulphur dioxide; measures for the reduction of emission; and guidelines for the restriction of emission. Careful maintenance and control in operation must make sure that all equipment, lines, and installations are tight. In case of operational failure, devices must exist which prevent the gases containing hydrogen sulphide from escaping into the open air. This may be effected, for example, by reconducting such gases at a suitable point into the gas system of the coke plant. Ventilation gases existing in current operation must be prevented from constituting a risk in a similar or other manner to such an extent that the permissible immission concentration is not exceeded. During cleaning and repair, any waste-water containing hydrogen sulphide must be adequately diluted, if necessary.

E-6577

RESTRICTING EMISSION OF SULPHUR DIOXIDE FROM COKE OVENS AND GAS PLANTS. [Gasauswurfbegrenzung Schwefeldioxyd Kokereien und Gaswerke Koksofen (Abgase).] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No 2110, 20p., Aug. 1960.

This specification concerns the emission of sulfur dioxide with the waste gases created by the firing of the coke ovens. The essential points treated herein are the type, composition and calorific value of the different underfeed gases as well as guide values for sulfur-dioxide emission; measures for reduction of emission and low-layer concentration of sulfur dioxide; and guidelines for the restriction of sulfur-dioxide emission.

E-6580

RESTRICTING EMISSION OF DUST AND SULPHUR DIOXIDE IN ZINC SMELTERS. [Auswurfbegrenzung Zinkhütten.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2284, 33p., Sept. 1961. 20 refs.

Descriptions of installations and processes for the production of zinc which lead to the formation of sulfur dioxide and dust are presented. Factors influencing dust and sulfur dioxide emissions, means of reducing these emissions, and established limits and guide values for permissible dust emissions from new installations are discussed.

E-6581

RESTRICTING DUST AND SULPHUR DIOXIDE EMISSION FROM LEAD SMELTERS. [Auswurfbegrenzung Bleihütten.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2285, 29p., Sept. 1961. 8 refs.

Descriptions of installations and processes for the production of lead which lead to the formation of sulfur dioxide and dust are presented. Factors influencing dust and sulfur dioxide emissions, means of reducing these emissions, and established limits and guide values for permissible dust emission from new installations are discussed. A list of VDI Clean Air Committee specifications is given.

E-6583

RESTRICTION OF DUST EMISSION IN ANTHRACITE-BRIQUET FACTORIES. [Staubauswurfbegrenzung Steinkohlen-Brikettfabriken.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2292, 15p., Oct. 1961.

The aims of this specification were: to describe the installations producing dust; to characterize the influences leading to the formation of fine dust; to indicate measures for the reduction of fine dust; to indicate principles for the selection and maintenance of suitable dust removal installations; and to establish guide values for the restriction of permissible dust emission in new installations.

E-6584

RESTRICTING EMISSION OF DUST IN ANTHRACITE-PROCESSING INSTALLATIONS. [Staubauswurfbegrenzung Aufbereitungsanlagen für Steinkohlen.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2293, 15p., Oct. 1961.

The aims of this specification are: to describe the installations producing dust; to characterize the influences leading to the formation of fine dust; to indicate measures for the reduction of fine dust; to point out principles for the selection and maintenance of suitable dust-removal installations; and to establish guide values for the restriction of permissible dust emission in new installations.

E-6585

RESTRICTING EMISSION OF DUST, TAR MIST AND GAS WHEN CHARGING COKE OVENS. [Auswurfbegrenzung für Staub, Teernebel und Gase beim Füllen von Koksofen; Kokereien und Gaswerke.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2302, 32p., June 1962.

This specification concerns the restriction of emission of dust, tar mist, and gas when charging coke ovens with coking coal. The technology, emissions, and the reduction of escape gas emission by reconducting the escape gases into the raw gas, combustion, and scrubbing are reviewed.

E-6650

Kuleshov, P. J.
AERODYNAMIC INVESTIGATION OF ELECTROSTATIC PRECIPITATOR C-180 MODEL. Koks i Khim., Vol. 12, p. 30-35, 1958. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 21-30, 1962
CFSTI: TT 62-11103

The purpose was to arrive at practical changes which might effect better gas flow distribution over the electrofilter cross section and thereby reduce its pressure drop and enhance its gas purifying efficiency. The A_2 model was made of plastic material on 1.10 scale. Air flow through the model precipitator was created by a fan which forced through the model over 1000 m^3 of air per hour. The effects of "live" area of the lower perforated distribution screen of the inflow conduit inside location of the double T-shaped supports on gas flow distribution and on pressure drop reduction were studied. As a result of such investigation the following two changes have been introduced: a) the inside protruding angular downward directed part of the gas inflow conduit has been abolished; b) the original perforated gas distributing screen No. 1 which had an open area amounting to 18 percent of the total screen area was replaced by screen No. 2, the open area of which amounted to 28 percent and in some cases by screen No. 3, with an open area of 35.0 percent.

E-6651

Kuleshov, P. J.
RAISING THE EFFICIENCY OF ELECTROSTATIC PRECIPITATORS, TYPE C-140. Koks i Khim., Vol. 4, p. 45-49, 1956. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 30-37, 1962.
CFSTI: TT 62-11103

A criterion for the determination of gas flow distribution over the cross section of a precipitator by a single value is described. The comparison of individual tests and the complete evaluation of their characteristics were of importance; the coefficient of uneven gas flow distribution - C.U.D., was developed to characterize the deviation in rate of gas flow from the median. Several ways of gas delivery were studied in an attempt to lessen their effect on gas flow velocity distribution. Most of the research was on appropriate perforated screen construction. Several types of distributing screens were studied with "live" (perforation) areas of geometric dissimilitude. The effect of fastening the lower ends of precipitating electrodes on the productivity of the electrostatic precipitators was studied. The upper distributing screen had no effect on the distribution of the gas flow across the electrostatic precipitator, and should be removed. Removal of the gas delivery extension from inside the electrostatic precipitator reduced the pressure drop and improved the gas flow distribution. A distribution screen with a variable "live" area (geometric dissimilitude type) and with larger openings at its periphery considerably improved the gas flow distribution. The best gas flow distribution over the electrostatic precipitator cross section was attained with a screen having a large (32 percent) and even "live" (opening) section over its entire area and a ring-shaped slit at its periphery. The resistance of this screen was low, it was easily machined and its installation is recommended in all industrial electrostatic precipitators. The installation of this screen in an industrial electrostatic precipitator increased its productivity by 100 percent without noticeable lowering in its gas purifying efficiency. Such increases in the productivity of the electrostatic precipitators makes possible a 40 percent saving in equipment investment. Fastening of the precipitating electrodes onto the partition walls considerably improved the gas distribution and lowered the hydraulic resistance (pressure drop).

E-6652

Kuleshov, P. J.
CONSTRUCTION DEFECTS IN TUBULAR ELECTROSTATIC PRECIPITATORS (ELECTROFILTERS). Koks i Khim., Vol. 1, p. 43-46, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 38-44, 1962.
CFSTI: TT 62-11103

The construction defects in the tubular electrostatic precipitators C-140 and C-180 used in coke-chemical plants are analyzed and suggestions are made for their elimination. The defects reviewed are: insulating boxes and insulators; corona-electrodes and field tension; inoperative electrodes; gas distribution; cut-off slide gates or valves; oxygen content determination; and gas load and designed production capacity.

E-6654

Semenov, P. A., Yu. V. Tumanov, and O. S. Chekhov
A VENTURI APPARATUS FOR AMMONIA ABSORPTION FROM COKE GAS WITHOUT AN ATOMIZER. Koks i Khim., Vol. 8, p. 34-37, 1960. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 47-53, 1962.
CFSTI: TT 62-11103

The most advantageous way of ammonia absorption from coke by sulfuric acid by means of Venturi absorbers (minus the atomizers) is discussed. The injection liquid is carried by the gas flow itself. Mass transfer in the gaseous phase was studied by the method of water absorption of ammonia from the air-ammonia mixture. Simultaneously the pressure drop was studied in relation to the flow rate of the gas through the Venturi throat and rate of spray. Ammonia concentration was varied from 0.5 to 2.0 percent by volume. Velocity of air ammonia mixture in the Venturi tube throat ranged from 30.0 to 72.5 m/sec. Three types of Venturi apparatus were investigated; the throat diameter in each measured 20 mm, length of the throat 3 mm, and the conical diffusor angles were 8, 17, and 30°. With the spray rate equal in all cases and varying the gas flow rate the productivity coefficient of the three apparatuses in all instances was the same; the conical diffusor angle had no effect on the degree of ammonia absorption. The data on mass transfer obtained with experiments in water absorption of ammonia can be applied with reasonable accuracy to ammonia absorption with weak solution of sulfuric acid. Resistance in the atomizer tube falls with the increase in the conical diffusor angle suggesting that an angle of 300 should be used in all types of Venturi absorbers operating at spray density exceeding 3-4 li/nm^3; this resulted in a reduced loss in pressure and smaller apparatus dimensions. Ammonia absorption from gases should not be conducted at high gas flow rates; the productivity coefficient increased to an insignificant degree whereas the pressure drop sharply rose. Ammonia absorption from coke gas by sulfuric acid is most advantageous when performed in two stages: at rate of gas flow through the Venturi throat amounting to 40.0 m/sec. and rate of water spray amounting to 6 to 7 li/nm^3 of acid per stage, the productivity coefficient of the entire apparatus would range between 99.0 - 99.5 percent at total pressure drop of 350 to 400 mm of water.

E-6655

Varshavsky, T. P., R. G. Agapov, F. A. Mustafin, and V. A. Permyakov
REDUCING GAS EMISSION DURING COKE OVEN CHARGING. Koks i Khim., Vol. 2, p. 23-30, 1956. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 56-63, 1962.
CFSTI: TT 62-11103

A method for loading coke ovens by steam injectors, which might cut down air pollution to a minimum by reducing coal gas and dust escape from the hatches and risers is described. A procedure was developed for charging coke ovens equipped with single gas collecting main by unloading one bunker at a time with the other hatches closed which improved considerably working conditions on top of coke ovens. The procedure is applicable only to coke oven charging with coal of not more than 6 percent moisture. A new procedure for charging coke ovens with 2 gas collecting outlets by unloading the first and third bunkers first was recommended and is currently in use industrially. Coke oven charging by steam injection caused coal dust to be carried way into the gas collecting mains; therefore, the method of steam injection is not currently used in the Eastern U. S. S. R. coke-chemical plants.

E-6656

Mezentsev, I. Ya.
SMOKELESS COKE OVEN CHARGING. Koks i Khim., Vol. 4, p. 23-30, 1958. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 64-68, 1962.
CFSTI: TT 62-11103

The advantages and disadvantages of steam injection used at the Moscow Coke-Chemical and the Zaporozhie Coke-Chemical Plants to attain smokeless coke oven charging were determined. Coke oven batteries with 2 gas collecting mains were investigated. 976 coke ovens were tested in the Zaporozhie plant. The first and second bunkers held 5.5 tons of coal each, the third bunker 6 tons. 923 ovens in the Moscow Coke-Chemical Plant were tested. First, two end bunkers were emptied and the hatches covered; the middle bunker was then emptied. The first and third bunkers contained 6.25 tons each, the middle 4.4 tons. A third procedure was also tested. In the first bunker - 6.3 tons, in the second - 4.5 tons, and in the third - 6.2 tons. The end bunkers were simultaneously unloaded and 22 seconds later the central bunker was emptied. Coal dust was directly proportional to time of steam injection. Coal dust and ash were carried off if the coal contained 3.5 percent of moisture; if 91 percent of the coal particles measured 3 mm or less in diameter and the partial vacuum at the bottom of the riser was 19 mm, 3.5 kg/min of coal dust were carried away. The injection steam pressure must produce a partial vacuum at the bottom of the riser of not less than 19 mm if charging is to be attained without any gas escape. The Moscow Coke-Chemical Plant procedure can be used with coal containing 7 percent moisture. Charging by the Moscow Coke-Chemical Plant procedure tested at the Zaporozhie Coke-Chemical Plant with coal moisture content of 8 and 10 percent had lengthened the loading time, increased the work intensity of the levelling bar, greatly increased the rate of coal dust pick-up, and increased the ash concentration in the separated tar to 0.153 percent as against 0.115 percent by the usual procedure. The efficiency of smoke abatement was considerably higher with the Moscow Coke-Chemical Plant procedure than by that of the Zaporozhie Coke-Chemical Plant. The most promising procedure was the third which consumed considerably less time than either of the other two.

E-6714

ELECTROSTATIC FORCES. J. Equipment Electrique Electronique, No. 201, p. 77-85, 1960. Translated from French. Technical Documents Liaison Office, MCLTD, Wright-Patterson AFB, Ohio, 17p., Sept. 13, 1961.
CFSTI: AD 268-876

Information, taken from reports presented at the International Conference of Grenoble, on practical applications of electrostatic forces is given. Industrial applications of electrostatic forces have been classified into four groups: (1) Capturing permits in particular the treatment of industrial gases and removal of dust from them, and the purification of air. (2) Depositing applies to electrostatic painting and to the treatment of plants. It also applies to the manufacturing of abrasive paper and cloth, to flocking of the surface of various objects, to powdering sheets of metal, and to the manufacture of fluorescent tubes; also in xerography, enamelling, metallization, lubrication of laminated steel, smoking of certain food products, and especially the treatment of cereal grains with insecticides before storing. (3) Extracting is known for its application to the draining of paint in installations for drip painting; and (4) Separating consists chiefly of sorting minerals, and sorting mixtures of sand and grains of steel coming from ingots. The most instructive applications are described.

E-6867

Dmitriev, M. T.
EFFECT OF IONIZING RADIATION ON THE COMPOSITION OF THE AIR WITHIN A FACTORY. [Vliyanie ioniziruyushchei radiatsii na sostav vozdukha proizvodstvennykh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(4):44-50, April 1965. 3 refs.

A study was made of the efficiency of the processes leading to the production of nitrogen oxides and ozone in the air under the action of ionizing radiation and neutrons. A comparison of the data obtained with concentrations of nitrogen dioxide and ozone gases, formed in the air under natural conditions, made it possible to set the maximum permissible doses of ionizing radiation and that of the integral neutron current in the air of industrial premises. The following values of the permissible absorbed dose and the integral neutron flux were obtained 530 r and 1.0×10^{12} neutr./cm^2 for 03 and 7×10^4r and 1.3×10^{14} neutr./cm^2 for nitrogen oxides. These values for the maximum permissible absorbed doses and the integral neutron fluxes may be used as initial data for determining the capacity of ventilation installations in factories where the personnel are subjected to irradiation. Safe entrance into the room after the termination of irradiation (when the radiation source has been automatically removed into a special well) will be ensured by a ventilation factor of 36 during the period of irradiation, at a typical mean dose rate of 10 r/sec. If the volume of the room is, for example, 150 m^3, the rate of the removal of air should not be less than 1.5 m^3/sec.

E-6877

Stezhenskii, A. I. and O. A. Zagorovskii
POLLUTION OF THE URBAN ATMOSPHERE BY NITROGEN OXIDES. [K voprosu o zagryazenii atmosfery gorodov okislami azota.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(6):408-410, June 1965. 2 refs.

The emission of nitrogen oxides and a possible measure for reducing NO_2 content in the flue gases discharged by the gas turbine are discussed. Nitrogen dioxide content in flue gas of different installations is compared and the highest NO_2 content is found in combustion products discharged by the gas turbine. The most practicable and efficient method for reducing the production of NO_2 is the reduction of the cooling (quenching) rate of the combustion product by lengthening the gas line leading from the combustion chamber to the turbine and by a gradual feeding of secondary air through a series of holes arranged at uniform intervals along the entire length of the gas line.

E-6383

Petrova, N. I. and Zh. I. Pokrovenko
METHODS OF REDUCING AIR POLLUTION DUE TO WASTE PRODUCTS FROM NIKITOVKA MERCURY WORKS. [K voprosu ob umen'shenii zagryazeniya vozdukha vybrosami Nikitovskogo rtutnogo zavoda.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1):74-77, Jan. 1965.
CFSTI: TT 66-51033

The pollution of air by mercury vapor depends on the total quantity of the furnace gases; trapping the mercury vapor in condensation systems; hermetic sealing of the equipment and of the gas flues; and special purification of gases before their discharge into the atmosphere. The most efficient method of preventing the pollution of the atmosphere by mercury vapor is by improving technological processes in the plant. For example, since the quantity of exhaust gas increases if the ore has a higher moisture content, it is important to keep this moisture content within the technical specifications for plants operating tubular and retort furnaces. The most complete condensation of mercury vapor reduces the amount of vapor in the exhaust gases to 50 percent and less. Such condensation is achieved by improving the performance of the condensation systems and by spraying the gas with water in scrubbers, or in the final compartment of the condensers. The furnace gases were purified by spraying with water in the retort furnace shop and by the use of the pyrolusite and selective chlorine-gas methods in the tubular furnace shop. Gases from the retort furnaces containing between 30 and 120 mg/m^3 mercury pass through two packed scrubbers sprayed with process water before being discharged into the atmosphere. The concentration of mercury vapor is reduced by nearly 80 percent on the average.

E-6384

Krupitskaya, I. D. and I. L. Pisarevskii
AN INCIDENCE OF MERCURY VAPOR CONTAMINATION OF RESIDENTIAL BLOCKS. [Sluchai zagryazeneia parami rtuti zhilykh kvartir.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1):81-83, Jan. 1965.
CFSTI: TT 66-51033

In view of the possibility of the poisonous effect of mercury, the preparation of amalgam in dentists' offices is authorized only in an exhaust hood with the fan turned on. Three such hoods were installed in the new dental clinic in Chelyabinsk. The ducts in the exhaust system leading from them were made out of asbesto-cement ductwork and ran through built-in closets in the apartments on the floors above the clinic. When the clinic was being accepted for operation, the sanitary-epidemiological station demanded the submittal of documents pertaining to the concealed work, with an indication that the exhaust ventilation had been executed according to the design. A year after the dental clinic had begun to operate, the sanitary-epidemiological station received complaints from the tenants in three stairwells in the building that medical smells were entering their apartments. After determination of the existence of mercury in the areas intended for human habitation, the sanitary-epidemiological station immediately prohibited the clinic from filling teeth with copper amalgam. Simultaneously the decontamination of the mercury in the apartments began. This process was carried out with an acidulous solution of potassium permanganate. At the request of the sanitary-epidemiological station, a commission was created, which established that the air seal of the exhaust ducts had been broken as a result of the settling of the building and by the fact that the asbestos-cement ducts had broken in a number of places where they fitted into the ceilings. Repeated tests on the apartments for the existence of mercury in them after the carrying out of all these measures yielded negative results.

E-6899

Mel'ster, F. G., S. L. Dubrovskii, V. P. Dumko, and A. M. Orlovskaya
REDUCTION OF ATMOSPHERIC POLLUTION IN TASHKENT. [O snizhenii zagryazeneiya atmosfernogo vozdukha v Tashkente.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(10):101-104, Oct. 1965.

Carbon monoxide, sulfur dioxide, hydrogen sulfide and dust concentrations in the atmosphere in Tashkent, Russia were determined, and means of reducing these pollutants are discussed. The transfer of boiler rooms, industrial enterprises, restaurants, canteens, etc., children's institutions, and public utilities to gas facilitated the reduction of the content of ash, black smoke, SO_2, CO, and H_2S in the city atmosphere. A green zone must be created around Tashkent to stop the dust from the Kazakh steppes. The area of green plantations within the city must be increased from 4 to 15 sq m per inhabitant, according to sanitary standards. Enterprises which are sources of atmospheric pollution must be transferred from the residential part of the city to the industrial zone. Where such transfer is impossible, the enterprises must be surrounded with a sanitary-protective zone. The streets must be systematically swept, and the sweeping must be followed by spraying with water. In summer, special trucks must be assigned for the washing of green plantations (trees, shrubs, flowers, etc.).

E-7093

REVIEW OF RESTRICTING GAS EMISSION FROM NITRIC-ACID PLANTS. Translated from German. Verein Deutscher Ingenieure - Richtlinien, No. 2295, 12p., July 1963.

The control of nitrogen oxides during the production of nitric acid is discussed. Nitrogen oxide emissions are restricted by absorption, suitable discharge outlets, and on the basis of imissions. Because of the particularities of nitrous gases, the content of the waste gases cannot be completely controlled.

E-7236

Arkhipov, A. S., P. I. Bogatkov, I. V. Oreshkevich, and N. V. Serednikova
PURIFICATION OF AIR FROM TETRAETHYL LEAD. Gigiena i Sanit., No. 3, p. 11-16, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 17-23, March 1960.
CFSTI: TT 60-21188

The high toxicity of tetraethyl lead, the stability of its molecule in the open air, and its concentration in ventilation air even when it is expelled at 50 or 75 m above the ground, point to the imperative need to eliminate tetraethyl lead from the air. In this connection, the chemical fluid filter was used. The experimental purifying installation consisted of a horizontal cylindrical reservoir 100 cm in length and 80 cm in diameter. The aqueous solution of suitable chemical absorbers is poured into the apparatus to a level 50 to 100 mm above its operating discs, as indicated by an attached glass water gauge. The filter operates by converting the chemical liquid absorber into a spray which creates a large specific surface of the substances used for recovering tetraethyl lead. The effectiveness of the filter was determined by taking air samples simultaneously at points of air entrance and exit and analyzing them for tetraethyl lead. For each analysis, 6.3 liters of air were aspirated and a total of 406 air samples were tested. The absorbent used was 0.5 percent alcohol solution of iodine. Tetraethyl lead was determined colorimetrically by the dithizone method. Tests were made with different absorbents for the selection of one most suitable for the purpose, taking into consideration the physico-chemical properties of tetraethyl lead. The degree of ventilation air purification from tetraethyl lead can be increased by installing a series of successive filters.

E-7287

Shefer, S. S.
DUST PREVENTION MEASURES FOR FOUNDRY SHOPS. Gigiena i Sanit., No. 3, p. 17-22, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 23-30, March 1960.
CFSTI: TT 60-21188

During 1950 - 1952 a group of Moscow industrial sanitary physicians in cooperation with scientists from the Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences, U.S.S.R., made a survey of the working conditions in the earth-processing and the trimming and cleaning sections of 12 foundry shops of different processing methods. This survey included an analysis of the results of periodic medical examinations of the workers, and of clinical morbidity data related to occupational diseases. A thorough examination was also made of the condition of the air in all earth-processing and trimming and cleaning sections; the results indicated that the principal defects were in the technology, in the type of equipment and in the sanitary technical arrangements; this information was helpful in formulating recommendations for the improvement of the working conditions of these sections. The dust concentration discovered in different shops varied widely. The wide variations in dust concentrations were the results of differences in planning the foundry shops, in the maintenance of the technological equipment, in the technological processes and in types and maintenance of ventilators and other sanitary installations. One of the outstanding factors was the shape of the building frame, another was the plan of the conveyors and scattered casting shops. (Author's summary, modified)

E-7586

Kaiser, Fritz
PRACTICAL SOLUTIONS FOR SIEVING AND [AIR] SIFTING PROBLEMS. STAUB (English translation), 27(1):49-54, Jan. 1967. 9 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

Plant engineering methods used for sieving and screening pulverulent materials are reported. Special measures must be taken to ensure tolerable apparatus cross sections and to achieve sufficient disintegration of agglomerates. In the case of sieving machines these measures are: excitation of sieve cloth by impact, mechanical high-velocity agitators, flow forces. In the case of an air elutriator the following means are to be used: high flow rate, secondary sieving of coarse material. The examples are selected in such a manner that the new operating elements are shown. (Author's summary)

E-7674

Petroll, Joachim, Volker Quitter, Günter Schade, and Lothar Zimmermann
TESTING CYCLONE SEPARATORS. STAUB (English translation), 27(3):1-10, March 1967. 12 refs.
CFSTI: TT 67-51408/3

Barth's cyclone theory was checked experimentally. The tests were carried out in the research division of the VEB PKM-Kohleverarbeitung, Leipzig. The test dust was soft-coal dust from the cooling-tower collector of a briquette factory, separated in banked cyclones. Cyclone separators of different dimensions and made by different firms were tested under identical conditions. The test results are compared with the results obtained by the calculation method for cyclone separators according to Barth. It has been found that the Barth theory still does not describe, quantitatively and qualitatively, the actual conditions in a satisfactory way. (Authors' summary, modified)

E-7675

Dubois, P. E.
WET SCRUBBER WITH ATOMIZATION OF THE CLEANING LIQUID. STAUB (English translation), 27(3):18-20, March 1967.
CFSTI: TT 67-51408/3

The operation of most wet scrubbers is based on atomizing a liquid, and on the comparatively rapid relative motion of the liquid droplets and the dust particles suspended in the gas. If the apparatus is to be used in industry, the diaphragm must include a device for regulating the flow, so that the pressure loss can be maintained constant within predetermined flow-rate limits. In the two scrubbers described the problem was solved quite simply. The dust-laden droplets were separated in a low-speed cyclone beneath the scrubber. This simple wet scrubber is used to clean the waste gases of lime kilns, electric-arc furnaces, ore-agglomerating furnaces, blast furnaces, etc. The wet scrubber with a rotating wedge is successfully used in many blast furnaces and LD-converters in the U.S.A. Using such a wet scrubber, a clean-gas dust content of only 10 - 15 mg/m^3 STP was achieved in a blast furnace. This apparatus requires little maintenance, and water of low purity and pressure can be used. Water is supplied through pipes at a pressure exceeding by 1 atm that of the gas. Wet washers are based on the principle of atomization of the fine droplets in a turbulent dust-laden gas. Venturi tubes or throttle valves are generally used for increasing the velocity and turbulence of gas. Agglomerations formed as a result of impact between droplets and particles are precipitated mechanically. Separation efficiency is a function of pressure loss of the throttle valve. To achieve a constant separation efficiency, different methods are used for controlling the cross section of a throttle valve. (Author's summary, modified)

E-8146

Uzhov, V. N.
SANITARY-TECHNOLOGICAL EVALUATION OF ASH-CATCHING SYSTEMS USED IN U.S.S.R. ELECTRIC HEAT AND POWER PLANTS. Gigiena i Sanit., 23(3):15-19, 1958. 1 ref. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 87-92, May 1960.
CFSTI: TT 60-21475

Two systems of ash-catching are presently in use in the U.S.S.R. electric heat and power plants which are burning hard fuel: 1) dry methods with the aid of battery cyclones and electrostatic precipitators, and 2) wet processes using centrifugal VTI scrubbers or MP-VTI wet rod type ash-abators. In the past electric power plants predominantly employed the dry type of ash-catching equipment; at present the trend has been reversed and the wet types of ash-catching installations have been favored predominantly. The two ash-catching systems were evaluated and to make a rational choice between the two the efficiency of wet system ash-catching equipment did not exceed 90 percent. Ash collected by the wet systems presents serious hauling away problems and makes utilization of the collected ash for commercial purposes difficult, if not impossible. The ash thus collected must be disposed of at ash dumps, which in themselves become sources of air dust pollution. Wet methods of electro-station smoke gas purification can be used in small electro-stations, especially those located away from inhabited localities. The installation of wet type ash-collectors may be sanctioned in old electro-stations in which for reasons of space scarcity the installation of electrofilters may present major difficulties. Electro-stations of any considerable size which are surrounded by inhabited foci must be equipped with dry system ash-collectors, consisting of combinations of two-stage ash-collectors: battery cyclones + vertical electrofilters of the DVP type, or of two tripolar horizontal electrofilters of the DGP type capable of insuring smoke gas purification of not less than 95 percent.

E-8155

Matsak, V. G.
THE UTILIZATION OF AIR DUST AND SMOKE PURIFICATION EQUIPMENT. Gigiena i Sanit., No. 4, p. 27-35, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 141-149, May 1960.
CFSTI: TT 60-21475

In purifying air and gases from dust, the following factors must be taken into account: a) the weight of dust, which may vary from a few milligrams to tens of grams per m^3 of air or gas; b) the size of dust particles and their weight/number ratios; c) the chemical composition of the dust and its susceptibility to wetting by water, oil, and similar fluids. Existing means of purifying air from dust and smoke can be divided into dry and wet methods. Settling chambers, inertia dust separators, porous filters, electrostatic precipitators, water spray washing, and oil filters are discussed.

E-8156

Karacharov, T. S. and Ye. I. Vorontsova
EFFICIENCY OF MINERAL WOOL FILTERS. Gigiena i Sanit., No. 6, p. 29-35, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 150-156, May 1960.
CFSTI: TT60-21475

The efficiency of bitumen treated mineral wool in an arc-welding shop as a dust remover was 80 percent, reaching 90 percent and even higher in isolated cases. After filtering, the air dust content did not exceed 1 mg/m^3 in a large majority of cases. Filtering the air through a layer of mineral wool reduced its dust content from 0.21 to 0.018 mg/m^3, which is approximately a removal of 91 percent of the dust. The content of oxides of nitrogen and of carbon monoxide in the recirculated air was below the limit of allowable concentration. The use of mineral wool for the purification of air from arc-welding aerosols proved practical only where the air load per 1 m^2 of the filter-layer did not exceed 450 - 600 m^3/hour; a greater load rendered the filter inoperative within a short time. The apparatus should be made up of individual filter cells and the mineral wool overlaid in a wave-like or zigzag manner. In computing the rate of air recirculation the residual dust content should be taken into account. It is suggested that the air supplied to the shop during the cold seasons should be not less than 30 percent of the total unventilated air exchange, which amounts to 700 - 1000 m^3/hour per 1 kg of burned electrodes. In these experiments, the dust-retaining capacity of 1 m^2 mineral filters averaged 200 g. With an initial air dust concentration of 5 mg/m^3 and a rate of air passing of 0.5 m/sec, a filter pad should last 25 hours or three working shifts. Where the initial dust concentration is greater than 5 mg/m^3, the time between filter changes should be shortened accordingly. The use of mineral wool for the purification of recirculating air in arc-welding shops may be more economical than the present fresh air method by 4 to 8 times.

E-8162

Matsak, V. G.
THE PURIFICATION OF AIR POLLUTED BY VAPORS AND GASES. Gigiena i Sanit., No. 8, p. 20-27, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 177-185, May 1960.
CFSTI: TT 60-21475

Methods for the recovery and purification of noxious substances ejected by gas exhaust and ventilating installations are reviewed. It was found easier to purify exhaust gases than to ventilate air. The methods include: chemical purification method, condensation method, liquid absorption method, and absorption by solid absorbents (adsorption). Present methods for air and gas purification can be rendered close to 100 percent free of most acid and alkali gases, organic solvent vapors and some other gases. But no effective and cheap method has been found up to the present for the recovery of carbon monoxide. Purification of air from solvent vapors, such as gasoline, acetone, acetates, etc. can be used effectively only in the case of tail gases and not in the purification of ventilating air, even though it is effective in both instances; the high cost makes its use for purification of ventilation air economically prohibitive. The possibility of using solid absorbents, such as activated charcoal and silica gel for the purification of ventilation air may apply to many cases. The primary obstacle lies in the high cost of adsorbent material and in the consumption of considerable electric energy in overcoming the pressure drop of recuperating installations.

E-8177

Nikitina, S. A. and A. B. Taubman
A DEVICE FOR THE EVALUATION OF THE DUST COLLECTING PROPERTY OF WETTING AGENTS. Gigiena i Sanit., 23(12):71-74, 1958. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air

Pollution and Related Occupational Diseases, No. 4, p. 48-53, Aug. 1960.
CFSTI: TT 60-21913

In the device described, dust collecting with water and with wetting solution sprays was done simultaneously in air having the same degree of dust concentration. The desired degree of dispersion is attained and regulated on the basis of precipitation time calculated by Stokes formula and the subsequent checking of particle size microscopically. The device used consists of a dust chamber which has a diffuser, three burettes, one for water and two for the wetting solution, and small beakers, one of which is for the collection of freely precipitating dust. The beakers are placed on a platform suspended from the cover of the chamber and are covered with metallic lids. With this device evaluations can be made of the general effectiveness of the wetting agents in relation to droplet size, the hydrophilic action of their adsorption layers, as well as the adsorption effect alone by separating it from the total effect. For the comparative study of the general effectiveness of the wetting solution, use is made of equal volumes of water and of wetting solution, working with capillary pipettes having tip openings of equal diameter, so that the number of droplets of water and of solution is different due to differences in their surface tension. For the determination of the adsorption effect alone use is made of burettes with different cross-section tips so chosen that the droplets of water and of the wetting solution are equal in size.

E-8178

Belousov, S. P., A. S. Dun, and I. I. Nikberg
THE USE OF BATTERY COMBUSTION CHAMBERS IN THE PURIFICATION OF INDUSTRIAL EMISSIONS INTO ATMOSPHERIC AIR. Gigiena i Sanit., 24(4):70-71, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 54-56, Aug. 1960.
CFSTI: TT 60-21913

The gas purifying installation described is of the type used in a Soviet coke-pitch plant. The coke was roasted in batteries of open flame furnaces of the "Yuzhkokremont" system; each battery consisted of 10 to 15 open flame furnaces. Reconstruction of the battery furnaces was carried out which consisted in rebuilding part of the furnace into purification installations of the supplemental combustion chamber type. Thus, the exhaust gases coming from the furnace flues were passed through the supplemental combustion chambers before entering the smokestacks. The supplemental combustion of pitch-coke waste products is accomplished at 1150 - 1500°. This high temperature is attained by sucking in extra air through special openings in the supplemental combustion chamber.

E-8181

Varlamov, M. L., G. A. Manakin, and Ya. I. Starosel'skii-
PURIFICATION OF EXHAUST GASES OF A SULFURIC ACID TOWER PLANT BY A FLOWMETER PIPE TYPE OF APPARATUS. Zh. Prikl. Khim., 31(2):178-186, 1958. 19 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 68-77, Aug. 1960.
CFSTI: TT 60-21913

A venturi apparatus for the recovery of spray, sulfuric acid aerosol, and nitrogen oxides from the exhaust gases of a sulfuric acid tower plant is described. The experimental arrangement consisted of two units: a small assembly, producing up to 50 m^3/hour, and a larger one producing up to 500 m^3/hour. In one apparatus, the fluid entered the main channel at an angle; in a second apparatus, the fluid entered tangentially and became distributed evenly over the perimeter of the diffuser. A third apparatus had a radial fluid feed in relation to its main axis. The separator walls of the small unit were arranged concentrically, which forced the passing gas to impinge upon the surface of the liquid twice in succession. Another type of tube was tested in connection with the large unit. This tube had two radial fluid feeds set at 90°, and a separator of the type of abbreviated cyclone TsKTI. The power consumed in the operation of the flowmeter tube type of apparatus in the purification of exhaust gases emitted by the tower nitrose system ranged between 5 - 6 kilowatt-hours per ton of H_2SO_4, or 10 to 12 percent of the total power used in the production of one ton of sulfuric acid by the nitrose method.

E-8182

Plit, I. G.
SCRUBBER APPLICATION TO CARBON DIOXIDE ABSORPTION BY POTASSIUM CARBONATE SOLUTION. Zh. Prikl. Khim., 31(2):186-191, 1958. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 78-85, Aug. 1960.
CFSTI: TT 60-21913

According to the present classification, the mechanism of CO_2 absorption by K_2CO_3 solution is one of chemosorption with a reversible chemical reaction in the liquid phase. The course followed by such a reaction is schematically presented. Two equations are introduced which represent the coefficients for all conditions of scrubber operation when the scrubber is operated on the counter flow principle. The equations consider such factors as the height of the packing, the migration rate of the absorbent, and the rate of gas flow. The major aims of this study were to determine the proportionality constants in these equations and to determine the effect of different factors on the kinetics of the absorption process. The apparatus used consisted of an absorption column 25.5 mm in diameter and a packing 465 mm high, consisting of Raschig rings. In the determination of the nominal coefficient K_f the effect of the gaseous phase was excluded by a 100 percent absorption of carbon dioxide. The experiments were made within a range of fluid flow of 1.83 to 18.7 m/hour, in relation to the scrubber cross section at temperatures ranging from 16 to 30°C. The capacity of the absorbent varied from 1.45 to 2.8 mol/l.

E-8183

Ganz, S. and M. A. Likshin
COKE GAS PURIFICATION FROM HYDROGEN SULFIDE IN HIGH SPEED ROTARY ABSORBERS. Zh. Prikl. Khim., 31(2):191-197, 1958. 1 ref. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 85-93, Aug. 1960.
CFSTI: TT 60-21913

The high speed horizontally rotating absorber used in this study was equipped with stationary discs, each of which had 12 paddles set at an angle. Studies were made of the effect of the hydrodynamic, as well as the physico-chemical conditions on the absorption rate. The effect of the hydrodynamic factors was studied with reference to the construction of the discs, their peripheral velocity, the volume rate of the gas flow, the height (volume) of the liquid in the horizontal absorber, and the rate of the horizontal movement of the liquid in the absorber. The effect of the physico-chemical factors was studied with reference to temperature, chemical absorption capacity of the solution and the H_2S

concentration in the gas. The greater number of experiments was carried out with a sodium arsenite solution containing 8.4 g/l As_2O_3. The results of the investigation indicated that the absorption rate of H_2S by sodium arsenite solution in a high speed rotary absorber was considerably greater than in tower systems. H_2S absorption in a rotary apparatus requires considerably lower reaction volumes, less metal, smaller capital investment and less electric power for its operation.

E-8184

Chertkov, B. A.
OXIDATION OF AMMONIUM SULFITE-BISULFITE SOLUTIONS IN THE RECOVERY OF SO_2 FROM SMOKE GASES. Zh. Prikl. Khim., 32(5):960-965, 1959. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 93-100, Aug. 1960.
CFSTI: TT 60-21913

Experimental results and theoretical relationships were compared with the actual oxidation process of ammonium sulfite-bisulfite solution under industrial conditions. This was done in a case of working solution oxidation in an installation for the recovery of SO_2 from smokestack gases by the cyclic ammonium process. It was seen that, as the total quantity of SO_2 absorbed in the absorber increased, the degree of oxidation was lowered, provided that other conditions remain the same. Hydrodynamic factors play no prominent role in the oxidation of the working solution, yet they affect substantially the rate of SO_2 absorption; therefore, lowest degree of oxidation will take place in the absorber under conditions of most intensive SO_2 absorption. From this point of view, intensive bubbling of the gas through a foam type absorber should be preferred to the use of a packed absorber.

E-8185

Posin, M. E., B. A. Kopylev, and E. Ya. Tarat
CARBON DIOXIDE ABSORPTION BY SODIUM HYDROXIDE FOAM. Zh. Prikl. Khim., 3(5): 1011-1018, 1957. 14 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 100-108, Aug. 1960.
CFSTI: TT 60-21913

The completeness and rate of carbon dioxide absorption by a foam layer of sodium hydroxide was studied under different conditions of CO_2 concentration and rate of flow, different NaOH concentrations, degree of carbonization of the alkaline solution, and temperature. It was demonstrated that coefficient (K) for carbon dioxide absorption by 3 N NaOH at 60° was practically independent of the CO_2 concentration in the gas within 2 to 15 percent. The functional relationship between NaOH concentration and coefficient (K) and (n) reached its maximum at 2 N NaOH. As the carbonization of the sodium hydroxide solution progressed, the magnitudes of (K) and (n) sharply diminished during CO_2 absorption by NaOH solution; these magnitudes were approximately four times as great as during absorption by a fully carbonized NaOH solution. Also, as the rate of carbon dioxide absorption by a sodium hydroxide solution of constant concentration decreased, the Na_2CO_3 concentration in the solution increased. On the basis of the data obtained it is possible to choose optimal conditions under which different gases can be freed of carbon dioxide, or for carbonization of alkaline solutions in the foam apparatus. Under properly organized conditions of foam apparatus operation, the rate of CO_2 absorption by a solution of NaOH can be increased to 4 to 5 times the rate of the widely used scrubber type gas purifiers.

E-8199

Arkhipov, A. S., P. I. Bogatkov, I. V. Oreshkevich, and N. V. Serednikov
PURIFICATION OF VENTILATION AIR FROM TETRAETHYL LEAD. Gigiena i Sanit., No. 3, p. 11-16, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 209-215, Aug. 1960.
CFSTI: TT 60-21913

A scrubber for use in plants producing tetraethyl lead (TEL) is described and illustrated. Effectiveness of 10 percent alkali, 1 and 3 percent household soap solution, chlorine water, mono- and diethylphenylpolyglycol esters, spent lubricating oils and kerosene-water mixtures in 1:6 and 2:5 ratios in the purification of ventilation air from low TEL concentrations was evaluated. Highest effectiveness was obtained by using 2:5 ratio of kerosene and water and air passage of 0.3 m/sec. Purification reached 90.1 to 96 percent. The results obtained in air purification from TEL in these experiments were not adequate; therefore, the air was emitted into the atmosphere at great heights to obtain the desired degree of the TEL dispersion.

E-8204

Rozanov, L. S.
PURIFICATION OF CUPOLA FURNACE CASES DISCHARGED INTO THE ATMOSPHERE. DISCUSSED AT THE MOSCOW CITY COUNCIL OF NATIONAL ECONOMY. Gigiena i Sanit., 23(11):86-87, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 264-267, Aug. 1960.
CFSTI: TT 60-21913

Measures for dust elimination and for improved gas combustion in foundries are discussed. Utilization of the heat produced by the combustion process for blast furnace heating was also considered. An example is cited of a cupola furnace which was equipped with a separate air preheater. The cupola furnace had provision for possible blast heating by burning waste gases and by utilizing the heat produced by burning fuel in the fire box. This furnace had an inside diameter of 400 mm and an operating height of 1700 cm which made possible the utilization of waste gas heat. This, in turn, permitted the attainment of high temperature blast and cast, and pig iron temperatures required by modern foundries. At the same time it helped to solve to a considerable extent the problem of supplemental burning and purification of the gases before they were emitted into the atmosphere. A closed cupola furnace is also described. The operating characteristics of this type of cupola furnace, with blast air preheated to 500°, are an increase in the furnace productivity, a reduction in coke consumption, an increase in cast or pig iron temperature to 1430 to 1480°, which results in better quality metal, in addition to improved sanitary-hygienic conditions in the vicinity of the plant.

E-8224

Amelin, N. I.
EFFECTIVENESS OF MEASURES USED IN DECREASING DUST GENERATED BY MEASURING OUT AND MIXING PARTICULATE MATERIALS. Gigiena i Sanit., No. 10, p. 14-19, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 143-148, Jan. 1961.
CFSTI: TT 61-11149

Modifications of the exhaust ventilating system for dust removal in an electrode manufacturing plant were presented. The largest amount of coal dust is created when the dry materials spill over during the preparation of the charge and during loading of the mixing machine. This work is done in the measuring and mixing divisions. The following changes in the work procedure were recommended: 1) feeding the charge into the mixer from the bin, not from a measuring transport or delivery car, by passing the charge through the bin with the lid open, and 2) suction (vacuum) cleaning of working areas. The measures proposed related to tightness of joints, efficient loading of particulate materials, and appropriately designed suction ventilation and resulted in marked hygienic improvements. Despite the fact that only a part of the proposed changes had been instituted, dust formation in the measuring division had been completely eliminated; it was reduced by 90 percent in the mixing machines.

E-8371

Dratwa, Heinrich and Harald Jüntgen
THE DESULFURIZATION OF FLUE GAS BY MEANS OF ADSORPTION COKES WITH VARIOUS PROPERTIES. STAUB (English translation), 27(7):1-9, July 1967. 10 refs.
CFSTI: TT 67-51408/7

The expected dust content in the drum waste gases, their dependence on starting material and the manufactured mixture, the specific properties of these dusts and dust removal was investigated. Plants were selected by locality, raw material, size and differing levels of equipment. The results of a total of 35 individual studies at 10 plants are presented. The quantity and particle size of dust in the waste gases of the drum extends through a wide range. Three groups are seen for dust content, largely determined by whether the starting material is washed, unwashed, or processed in mixed components. Given the capacities of modern cyclone collectors it can be expected that some 85 to 92 percent of the dust of this composition will be retained in the first stage. Efficiency increases with increasing coarse components up to a possible 95 percent. Good wet scrubbers separate residual dust from the first stage with efficiencies of 95 to 96 percent. Fabric or bulk layer filters used instead of wet scrubbers can attain efficiencies above 99 percent. For particles of about 10 and 20 μ the settling velocities are only 0.8 and 3.2 cm/sec. Coarser particles of 40 μ settle at 12.8 cm/sec. Being stirred up by tipping processes in the drums, such particles are easily emitted with the gases. The drag of waste gases is still so great that 55 to 70 percent, and sometimes even up to 90 percent of all dust particles in the waste gases are larger than 40 μ.

E-8372

Wiemer, Peter
DUST REMOVAL FROM THE WASTE GASES OF PREPARATION PLANTS FOR BITUMINOUS ROAD-BUILDING MATERIALS. STAUB (English translation), 27(7):9-22, July 1967. 2 refs.
CFSTI: TT 67-51408/7

Dust in waste gas from preparation plants for road building depends on many characteristic factors. This is valid for the dust at the drying drum outlet and also for clean gas dust at the chimney inlet. The crude gas dust is naturally influenced by the properties of raw material, while clean gas dust is also influenced by the dust removal method used. These problems are discussed on the basis of a wide range of numerical data.

E-8788

Plekhotkin, V. F., A. P. Kitts, and S. S. Gavlovskaya
ELIMINATION OF NITROGEN OXIDES FROM DISCHARGED GASES. [O sanitarnoi ochistke otkhodyashchikh gazov okislov azota.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):457-458, July-Sept. 1967. 3 refs.
CFSTI: TT 67-51409/3

In order to devise a method for a more complete purification of discharged gases, experiments were performed on a laboratory 2-stage unit consisting of a packed absorber and a filter of an anion-exchange resin. The packed absorber (the first stage of the unit) was selected in such a manner that it should reduce the concentration of nitrogen oxides to permissible levels. The original gas-air mixture contained 10.4 mg/l nitrogen oxides with a degree of oxidation about 100 percent. The degree of absorption decreased at higher linear velocities of the gas flow. The degree of absorption declines abruptly when the concentration of nitrogen oxides falls below 13 mg/l. In the case of alkaline purification the concentration of nitrogen oxide in the purified gas is 1.88 mg/l even at low velocities of the gas flow. If the concentration of nitrogen oxide in the original gas is below 10 mg/l, their concentration in the outgoing gas will be higher than permissible on account of the abrupt decrease in the degree of absorption. It was demonstrated by subsequent investigations that a more complete trapping of nitrogen oxides is possible only in the second stage of the unit, viz. the anion-exchanger filter. Thus, it was experimentally proved that alkaline absorption does not achieve compliance with sanitary standards in the purification of the outgoing gases from nitrogen oxides. There is a necessity for installing an anion-exchange filter after the alkaline absorber, and then it is possible, under certain conditions, to achieve a fairly complete trapping of nitrogen oxides.

E-9270

Graue, Georg and Ronald Flossmann
SOME EXPERIENCES WITH A NOVEL EXPERIMENTAL PLANT FOR DUST REMOVAL FROM BROWN SMOKE. STAUB (English translation), 27(10):7-12, Oct. 1967. 5 refs.
CFSTI: TT 67-51408/10

A novel method for removing dust from brown converter smoke has been developed which utilizes the special properties of brown smoke and is very promising as regards economic and technical advantages. Its principles have been fixed by laboratory tests and in an experimental pilot plant. Earlier results have been basically confirmed in an industrial plant of 2 x 25,000 Nm^3/h. However, as a result of constructional deficiencies concerning gas distribution and constant electrode gap in the filters, the method could not be tested to its maximum capacity. The achieved dust contents of clean gas have, therefore, been higher than the value required by authorities, i.e., 150 mg/Nm^3. This value should, however, be reached after improvements in the design. (Authors' summary)

F-4072

Chen, Yun-tai
EXPERIMENTAL DATA AS A BASIS FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE XYLOL CONCENTRATION IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(2):93-95, Feb. 1963. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 43-47, 1966.
CFSTI: TT 66-61429

Xylol is used as a solvent in the lacquer industry, in the production of synthetic rubber, and other similar industries. Therefore, it is possible that the atmospheric air surrounding such industries should be polluted with xylol; despite that, no maximal permissible xylol concentration in the atmospheric air had been established officially, and no investigation had been conducted for the determination of effects produced on the human organism by low xylol vapor concentrations. Studies of xylol effect on animals had been conducted only in large concentrations. Data thus far found in the literature were limited to the effect of high xylol concentration and that the effect of low concentrations had been neglected, which may explain the reason for which no attempts have been made thus far to determine the maximal permissible xylol concentration in atmospheric air. Therefore, the present author undertook to investigate this phase of air sanitation. Procedures used in this investigation were the same as previously described by other investigators, namely, determining the concentration of xylol odor perception threshold and also the concentration of xylol threshold reflex effect on eye sensitivity to light using the dark adaptation method. Xylol vapor concentrations below its threshold of odor perception affected eye sensitivity to light in all the test persons. The concentration of threshold xylol vapor odor perception in most sensitive test individuals was found at 0.73 mg/m^3. Reflex effect of xylol vapor on eye sensitivity to light had been noted at 0.5 to 0.6 mg/m^3. Xylol vapor concentration not perceptible by odor produced observable changes in eye sensitivity to light.

F-4073

Barkov, B. K.
BASIC EXPERIMENTAL DATA FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE CONCENTRATIONS OF CARBON DISULFIDE AND HYDROGEN SULFIDE SIMULTANEOUSLY PRESENT IN THE AIR. Gigiena i Sanit., 28(3):3-7, March 1963. 15 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 47-52, 1966.
CFSTI: TT 66-61429

Most maximal permissible concentrations of atmospheric pollutants have been adopted in the U.S.S.R. on the basis of their individual presence in the air, despite the fact that under actual conditions the atmospheric air frequently contained two or more suspended harmful substances simultaneously; it has been established that where two or more substances are simultaneously present in a medium the effect of each component might be different than when the components are present individually. The most frequently occurring simultaneous presence of two harmful substances in the atmosphere is that of carbon disulfide and hydrogen sulfide, especially in air surrounding plants producing viscous fibers. In studying the combined effect of the two vapors the concentration of each ingredient was expressed in fractions of its concentration corresponding to its threshold odor perception. Inhalation of air containing vapors of carbon disulfide and hydrogen sulfide simultaneously in maximal permissible average 24-hour concentrations had no noticeable adverse effect on rats under conditions of daily 24-hour chronic exposure. Chronic 24-hour daily exposure of rats to inhalation of air containing 10 mg/m^3 of carbon disulfide elicited in the experimental animals changes in muscle antagonists chronaxy, in cholinesterase activity in the concentrations of total blood serum protein, in the free SH-groups, and produced pathoanatomical changes in some internal organs. Results of the present investigation also showed that the previously adopted maximal permissible CS_2 and H_2S maximal single average 24-hour concentrations were below the threshold summation effect; therefore, in evaluating the sanitary condition of atmospheric air polluted simultaneously by the two studied components the norms recommended by the Government State Sanitary Inspector may prevail without correction factors.

F-4074

Pan'shina, T. N.
EXPERIMENTAL DATA FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE PHOSPHAMIDE CONCENTRATION IN THE AIR OF WORKING PREMISES. Gigiena i Sanit., 28(3):21-27, March 1963. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 52-58, 1966.
CFSTI: TT 66-61429

Determination of maximal permissible phosphamide concentration in the air can be arrived at on the basis of results obtained in tests with experimental inhalation. Such tests had been performed with cats and rats which were placed into a special inhalation chamber the air of which contained given concentrations of technical phosphamide in the vapor and emulsion aerosol state. The latter was used to simulate conditions under which phosphamide was used under practical conditions in agriculture. Animals had been exposed to the phosphamide inhalation for 4 hours. Phosphamide concentrations in the exposure chamber air were checked every half-hour. Results show that effects of single inhalation exposure, were less toxic to the experimental animals than the other phosphoinsecticides, such as thiophos, mercaptophos, or methylmercaptophos. 0.0005 mg/li of phosphamide vapor or aerosol in the air of working locations is here recommended as the maximal permissible concentration of this preparation. This phosphamide vapor or aerosol concentration is 10 to 20 times below the threshold concentration established for single exposure to its inhalation, and 10 times below the phosphamide vapor concentration which under conditions of chronic experiments brought about a considerable loss in cholinesterase activity in the experimental cats, without eliciting any visible signs of toxicity. Exposure of rats and cats to the inhalation of air containing phosphamide vapor, or aerosol, in concentrations exceeding 3 to 4 times the concentrations recommended above as maximal permissible elicited no noticeable symptoms of toxicity in the experimental animals. The recommended maximal permissible phosphamide concentration reflects the experimentally established toxicity parameter for this substance as compared with toxicity parameters of other phosphoorganic insecticides. It has been officially accepted by the Committee on Limits of Allowable Concentrations by authority of the Chief U.S.S.R. Government Sanitary Inspection.

F-4076

Baranovskii, I. I. and A. I. Kleiner
RESPIRATORY ORGAN DISEASES AMONG CHROMIUM INDUSTRY WORKERS. Gigiena i Sanit., 28(3):72-75, March 1963. 22 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related

Occupational Diseases, No. 12, p. 63-67, 1966.
CFSTI: TT 66-61429

Work-time lost by workers of the chromium manufacturing industry due to morbidity of the respiratory organs was investigated and compared with results from a similar investigation conducted among workers of the ferroalloy and construction industries. The investigation was begun in 1958, and was concluded in 1960; it covered 1000 workers in each respective field of employment. Results showed that the length of industrial service among the chromium manufacturing workers averaged 3 years, among the structural industry workers 5 years, and among the workers of the ferroalloy industry the average work period was 15 years. The comparative analysis of respiratory organ diseases, such as catarrh of the upper respiratory passages, grippe, pharyngitis and laryngotracheitis, accessory nasal sinusitis, bronchitis, lung inflammation, pulmonary tuberculosis, etc., and of lost work time failed to establish any morbidity increase among workers employed in the chromium production industry for a period of 3 years. This conclusion appears valid even for workers who had chromium rhinitis and pathological changes of the accessory nasal sinuses disclosed by roentgenologic examination.

F-4079

Suvorov, S. V.
INDUSTRIAL TUNGSTEN, MOLYBDENUM AND RHENIUM CONDENSATES AND THEIR HYGIENIC EVALUATION. Gigiena i Sanit., 28(4):24-28, April 1963. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 80-85, 1966.
CFSTI: TT 66-61429

Many metallurgical industrial processes generated tungsten, molybdenum and rhenium condensation aerosols resulting from high temperatures to which ground granules and powders of these metals are heated. Inhalation of air containing highly dispersed molybdenum, tungsten and rhenium aerosols under certain conditions disturbed the normal functional state of the respiratory organs. Inhalation of tungsten, molybdenum and rhenium condensation aerosols developed chronic interstitial pneumonia accompanied by pneumosclerosis, tension of the endothelial system and dystrophic changes in the parenchymal organs. Condensation aerosol of molybdenum and rhenium elicited morphologic changes in the body organs, disturbed the process of protein metabolism, eliciting dysproteinemia, and a rise in the rate of amino nitrogen elimination with the urine towards the end of the experimental period, and lowered the activity of alkaline phosphatase. Inhalation of air containing equivalent concentrations of mechanical and condensation aerosols showed that the latter had a higher toxicity parameter. Therefore, the maximal permissible tungsten, molybdenum and rhenium crude aerosol concentrations cannot be applied to the condensate aerosols of the same rare elements. In attempting to determine the maximal permissible rhenium dust concentration in the air consideration must be given the fact that rhenium in its metallic form, or in solution, is less toxic than tungsten or molybdenum in the form of mechanical dust; at the same time it was shown that in the form of the condensate aerosol rhenium was more toxic than aerosols of either of the other two rare metals. Therefore, the maximal permissible concentration in the air of rhenium in the form of its condensate aerosol must be set below the ones set for tungsten and molybdenum. Accordingly, it is recommended that such concentration for rhenium condensate aerosol be set at 4 mg/m^3.,

F-4080

Arkhipova, O. G., M. S. Tolgskaya, and T. A. Kochetkova
TOXIC PROPERTIES OF MANGANESE CYCLOPENTADIENYLTRICARBONYL ANTIKNOCK SUBSTANCE. Gigiena i Sanit., 28(4):29-32, April 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 85-89, 1966.
CFSTI: TT 66-61429

Manganese cyclopentadienyltricarbonyl has been used as an antiknock substance for internal combustion engines instead of tetraethylead. It is more easily manipulated and is less harmful than tetraethylead. In the course of its production the new antiknock substance finds its way into the organism through inhalation and through the oral route by ingesting food inadvertently contaminated by careless handling and by inhaling air-suspended dust. Therefore, the toxic properties of the new antiknock compound were studied by the method of direct gastrointestinal administration. Changes in the state of the nervous system in the peripheral blood circulation, as well as in the functional state of the liver and kidneys, were determined pathomorphologically by examining internal organs of experimental animals. Manganese cyclopentadienyltricarbonyl was administered to the animals by a gastric tube in 1 ml quantities in sunflower-seed-oil solution. Control animals were administered sunflower-seed-oil alone. Results of the tests indicated that gastrointestinal administration of 200 mg/kg of the preparation killed all the animals and constituted the absolute lethal dose, while the administration of 150 mg/kg killed 60 percent of the experimental white mice and was regarded as close to the LD_{50} dose. Occasionally experimental white mice died following the administration of 100 mg/kg. None of the experimental white mice died which received doses below 100 mg/kg. White rats proved the most sensitive to the effects of the new antiknock substance, as shown by the fact that 120 mg/kg proved to be the LD_{100} dose; 80 mg/kg killed 60 percent of the experimental animals; 40 mg/kg was the minimal lethal dose, and 20 to 30 mg/kg was the maximum tolerance dose. It should be noted that animal experimental tests made with samples of 4 batches of the antiknock substance yielded identical results, showing that they possessed identical toxic properties. Acute and subacute intoxication stages showed the predominance of symptoms related to damage done to the neurovascular system and to the gastrointestinal tract. Dystrophic changes had also been noted in other organs and the compound manifested marked cumulative and hemolytic properties.

F-4081

Pavlovskaya, N. A., T. N. Cherkashina, and R. K. Yunisova
DETERMINATION OF SMALL THORIUM QUANTITIES IN BIOLOGICAL SPECIMENS. Gigiena i Sanit., 28(4):48-52, April 1963. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 89-94, 1966.
CFSTI: TT 66-61429

The following 3 methods for thorium determination in biological specimens have been described: the differentia method with the aid of arsenazo III, and 2 methods based on chromatographic partitioning of thorium from admixtures on cationic reagent KU-2 and strongly acid ionoexchange resin No. 2, followed by final colorimetric or electrophotocolorimetric determinations. The lowest amount of thorium which could be determined by the differentia method was 2.5 micron using the colorimetric method, and 0.5 micron using the photoelectrocolorimetric method. The lowest amount of thorium that can be determined in a biological specimen with the aid of cationic resin KY-2 was 1 micron, and with the aid of the highly acid ionoexchange I it was 0.5 micron using the "thoron" reagent; it was 0.1 micron when arsenazo III reagent was used. The error in determining thorium by the differential method was within the range of 10 to 15 percent. Interfering factors in this method were zirconium, titanium, and fluorides. Determination of thorium in biological specimens with the aid of ionoexchanges resins I and KY-2 following specimen mineralization was free from titanium and zirconium interference.

F-4083

Gusev, M. I. and K. N. Chelikanov
EXPERIMENTAL DATA AS A BASIS FOR THE DETERMINATION OF THE MAXIMAL PERMISSIBLE AMYLENES (PENTENES) CONCENTRATION IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(5):3-8, May 1963. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 99-105, 1966.
CFSTI: TT 66-61429

It was established that 1.8 mg/m^3 of amylene in the atmospheric air represented the concentration of threshold odor perception of the substance. Continuous 24-hour exposure of white rats to the inhalation of air containing 9.8± of 0.51 mg/m^3 of amylene for 75 days elicited statistically significant enhanced porphyrin metabolism, lowered cholinesterase activity, and increased number of luminescent leucocytes. In addition, the animals' pattern of established reflex responses had become disturbed. Some microscopic histologic changes had been noted in the organs and tissues of autopsied rats, most notable among which were pathologic lung changes. Exposure of rats to the inhalation of 1.9±, 0.22 mg/m^3 of amylene under similar experimental conditions elicited none of the above enumerated changes, with very slight postmortem exceptions. On the basis of the above discussed results, it is recommended that the maximal permissible amylene concentration in atmospheric air be set at 1.9 mg/m^3.

F-4084

Zlobina, N. S.
THE TOXICITY OF LOW STYROL VAPOR CONCENTRATIONS. Gigiena i Sanit., 28(5):29-35, May 1963. 12 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 110-116, 1966.
CFSTI: TT 66-61429

Statistical comparative evaluation of morbidity and work time loss records of workers employed in plants producing polystyrol disclosed high rates of liver and gall bladder morbidity, fall in arterial blood pressure, and a variety of complaints characteristic of systemic intoxication with styrol vapor. Since the prevailing styrol vapor concentration in the air of the plant was below the permitted 0.5 mg/liter concentration it was assumed that the official limit was set too high. Chronic experiments with animals exposed to the inhalation of 0.05 mg/liter of styrol vapor impared the glycogenic liver function, the liver parenchyma, and brought about many other pathologic functional and morphologic changes in the experimental animals. Some of the pathologic changes were reversible, others were permanent. Results of tests performed with rats indicated that 0.005 mg/liter of styrol vapor concentration constituted its threshold of harmful effect for rats. It is recommended that 0.005 mg/liter of styrol vapor be adopted as the maximal permissible concentration in the air of working premises.

F-4088

Ostrovskii, M. M.
LABOR AND SANITARY HEALTH CONDITIONS IN PHTHIVAZIDE MANUFACTURING PLANTS. Gigiena i Sanit., 28(6):24-28, June 1963. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 140-144, 1966.
CFSTI: TT 66-61429

Observations were made in a plant producing isonicotinic acid, which is an intermediate product of phthivazide manufacture. Phthivazide results from the reaction of isonicotinic acid with thionyl chloride which forms first chloranhydroisonicotinate hydrochloride which is converted into ethyl-nicotinate-hydrochloride; the reaction mass is neutralized by an alkaline solution, which yields amyl nicotinate; from which hydrazide of isonicotinic acid is formed upon the addition of hydrazine hydrate. Hydrazide of isonicotinic acid is used in the final synthesis of phthivazide. In the production of isonicotinic acid and phthivazide, the air in the working premises may become polluted with vapors of picolines and of hydrazine hydrate; in some cases the air may also contain nitrogenous gases, sulfur dioxide, and fine particles of phthivazide and nicotinic acid. Repeated analyses had shown that hydrazine hydrate vapor concentrations in the air could be considerably reduced by improving the existing system of local ventilation. However, such reduction still failed to satisfy the official standards of air conditioning in working premises. Therefore, it is suggested that the following basic changes be instituted in the phthivazide producing plant without delay: 1. Isolation and encasing of equipment used in the utilization of beta-picolinic fraction components used in the intermediate steps of phthivazide production; 2. Installation of an interdepartmental pneumatic system for the distribution of isonicotinic acid and soda; 3. Introduce the use of automatic packaging machines in the final phthivazide production operations.

F-4089

Asribekova, T. A.
HYGIENIC ASPECTS OF METHYLMERCAPTOPHOS SPRAYING BY AIRPLANES. Gigiena i Sanit., 28(6):28-34, June 1963. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 144-150, 1966.
CFSTI: TT 66-61429

Noncompliance with safety regulations in field work with methylmercaptophos may lead to intoxication of the central and vegetative nervous systems accompanied by changes in the morphologic blood composition and in its physico-chemical properties. Accordingly, those who work with methylmercaptophos must be provided with, and must be compelled to wear, devices of individual protection against occupational intoxication. Medical examination of pilots and chemical and technical workers engaged in crop spraying must include blood cholinesterase activity determinations. No one should be assigned to work in chemical field and crop aerospraying with methylmercaptophos from the air without a preliminary medical examination. Air field and crop spraying with methylmercaptophos should be done from airplane A-2 and YAK-12 which must be equipped with removable tanks containing the insecticide concentrate. All equipment of airplanes used in field and crop spraying must be mechanized and made leakproof. During field and crop aviospraying the kolkhoz and sovkhoz administrations must provide workers employed on the chemical storage and distributions grounds with properly fitting individual devices for their protection against the toxic effects of the insecticide spray or vapor. Airplanes and helicopters built for field and crop spraying with insecticides must be equipped with air conditioned systems for the removal or neutralization of the toxic insecticide vapor. R A-59 is at present the best type of apparatus or respirator designed for the protection of workers against the inhalation of active chemical poisons.

F-4092

Aldyreva, M. V.
EXPERIMENTAL DATA AS A BASIS FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE POROPHORE CHKH 3-5 CONCENTRATION IN THE AIR OF WORKING PREMISES. Gigiena i Sanit., 28(7):18-23, July 1963. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 167-172, 1966.
CFSTI: TT 66-61429

Toxicity parameter of porophore ChKh 3-5 was determined by administering the substance to experimental animals intragastrically. Results showed that LD_{100} equalled 0.2 g/kg. The closeness between the tolerance and lethal dose characterizes porophore as a substance having a narrow toxic activity zone. Experimental inhalation of porophore in 20 - 30 and in 7 - 10 mg/m^3 concentrations for a short time, and in 2 - 4 mg/m^3 concentrations for a long time killed the experimental animals, clearly indicating that porophore ChKh 3-5 was a highly toxic preparation. Results of the investigation brought out the dominant effect of porophore ChKh 3-5 on the erythrocytes and on the central nervous system, the first being in the nature of hypoxia and the second in the nature of profound pathomorphologic changes in experimental animals which died as a result of the porophore administration. Chronic effect of porophore dust inhalation in average concentration of 0.6 mg/m^3 elicited reversible functional shifts in the red blood cells and in the arterial blood pressure; slight functional changes in the nervous system and in cholinesterase activities were transient. Based on the experimental data it is recommended that 0.05 mg/m^3 of porophore ChKh 3-5 in the air or working premises be adopted as its maximal permissible concentration.

F-4093

Yakubov, A. Ya.
LABOR CONDITIONS PREVAILING IN SPRAYING COTTON CROPS WITH PHOSPHO-ORGANIC INSECTICIDES. Gigiena i Sanit., 28(7):24-27, July 1963. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 173-176, 1966.
CFSTI: TT 66-61429

The sanitary hygienic labor conditions prevailing in the application of phospho-organic insecticides to agriculture were studied in different climatic U.S.S.R. regions. The investigation was concerned with the application of phospho-organic insecticides to cotton crops. The conclusions of the author are as follows: Cotton crop spraying with phospho-organic insecticides created a considerable insecticide concentration in the air at working level. Results of most analytical tests showed an insecticide air concentration exceeding the maximal permissible limit. Most appropriate method from the viewpoint of lower air pollution was the airplane method of crop spraying. Studies had been conducted for the determination of negative effects produced by air suspended insecticide on physiological indexes of workers engaged in cotton crop spraying with phospho-organic insecticides; results established that workers connected with cotton crop treating by manually operated sprayers were more vulnerable to the effect of the insecticides. The same can be said of tractor-hose spray workers, of signal workers, and of the repair men employed in the aviation method of insecticide crop spraying. Some of the physiological changes noted among the workers, such as hypotonia, thirst, hyperhidrosis, etc., may have been the result of high air temperature or other environmental causes. It is suggested that under climatic Tadzhik SSR conditions, coupled with high temperature and excessive solar radiation, the combined effect of the insecticide and of high air temperature should be taken into consideration in making final sanitary hygienic evaluations.

F-4094

Karpova, M. I. and S. A. Stepanov
EXPERIMENTAL STUDY OF GRAIN DUST HARM. Gigiena i Sanit., 28(7):28-32, July 1963. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 177-181, 1966.
CFSTI: TT 66-61429

The effect of grain dust on respiratory organs of animals was studied experimentally. Grain dust contained large quantities of fungal spores, some of which might have been pathogenic to man. Therefore, the experimental study included a determination of pathogenic changes which the grain-dust and the fungal spores could produce in the organism. The authors' conclusions are as follows: Grain dust is composed of approximately 70 percent organic and inorganic substances and 17 percent of free silicon dioxide; it also contains spores of different fungi. Grain dust suspended in the air of grain elevators and of mechanized conveyors consists mostly of high dispersion particles measuring less than 5 microns in diameter. Actual concentration of the latter, according to analytical results, varied between 82.6 and 97.6 percent. Experiments with rats showed that the effect of grain dust on respiratory organs was due to the presence in the dust of mineral and organic admixtures, and to the presence of fungal spores and hyphae. Intratracheal and inhalation administration to rats of natural and sterilized grain dust elicited in the animals catarrhal and purulent bronchitis, interstitial, peribronchial and abscess forming pneumonia, and the formation of nodular granules consisting of epitheloid, histioid, lymphoid and giant cells. Progressively changing mechanization of technological processes in grain moving and storing increased the air pollution intensity in grain elevators and in mechanized conveyors creating an urgent need for a thorough hygienic evaluation of labor conditions and a study of morbidity among workers employed in the grain industry. Results of such investigations should serve as a basis for the recommendation of sanitary hygienic improvements in working conditions of the grain industry.

F-4096

Bartenev, V. D.
MICRO DOSE GAS DELIVERY APPARATUS. Gigiena i Sanit., 28(7):46-48, July 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 183-184, 1966.
CFSTI: TT 66-61429

In conducting toxicological studies based on the continuous supply of gas into an exposure chamber there arises the need for delivering small gas doses at one minute intervals; this applies in particular to studies conducted with gases and vapors under chronic experimental conditions. The present author developed a simple micro dose gas delivering apparatus which operated on a continuous basis delivering 100 ml of the tested gas up to tens of thousands ml per minute. The apparatus consists of a medical type syringe which intermittently sucked in and forced gas out. The studied gas is first collected into a suitable collapsible container from which it passes through a T-shaped connection into a system of tubes equipped with valves or pinch-cocks, which automatically control the flow direction of the gas. The apparatus construction is a simple one. It has no complex detail parts and can be assembled in any laboratory, and can be easily set to deliver any desired gas volume at any desired time intervals. The model described has been used in the author's laboratory in studying the chronic effect of toxic gases on experimental animals.

F-4104

Arkhipova, O. G., T. A. Kochetkova, and B. N. Shinkarenko
TOXIC PROPERTIES AND BIOTRANSFORMATION OF BENZOTRICHLORIDE. Gigiena i Sanit., 23(10):30-34, Oct. 1963. 4 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 232-237, 1966.
CFSTI: TT 66-61429

Benzotrichloride is a toxic substance. Air containing 1 mg/li of benzotrichloride vapor was lethal to white mice and rats. Experimental animals subjected to acute benzotrichloride poisoning developed irritated conjunctiva and mucous membranes of the upper respiratory tract, dyspnea and disturbances of the nervous system. A single exposure to the toxic effects of benzotrichloride elicited in the experimental animals vascular disturbance in the internal organs and in the brain, catarrhal desquamative bronchitis and focal purulent pneumonia, also dystrophic liver dysfunction. Repeated benzotrichloride inhalation possessed the potentiality of eliciting chronic intoxication paralleled by loss of weight, leucopenia, and fall in arterial blood pressure. Repeated benzotrichloride inhalation elicited in the experimental animals changes at the point of its entrance, of which purulent bronchitis and pneumonia were the gravest along with changes which indicate general resorption of the substance and its capacity to disturb the blood circulation system, to produce dystrophic liver, kidney and suprarenal changes, as well as profound changes in the cortical layers of nerves, and in the thalamo, hypothalamic region. Benzotrichloride is partly eliminated with the urine as hippuric acid. Benzotrichloride penetrated through intact skin, and elicited symptoms of poisoning, such as leucopenia and alopecia. Damage done to intact skin by the direct application of benzotrichloride healed very gradually.

F-4107

Burkatskaya, E. N. and G. A. Voitenko
ORIENTATION DATA FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE DDT CONCENTRATION IN THE AIR OF WORKING PREMISES. Gigiena i Sanit., 23(11):36-39, Nov. 1963. 13 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 257-260, 1966.
CFSTI: TT 66-61429

DDT inhalation proved toxic to warm blooded animals. The minimum toxic DDT concentration in the air under conditions of acute experiments was 0.005 mg/li for cats and toxic effects were produced by 0.02 mg/li. In chronic experiments 0.008 mg/li of DDT in the air elicited sharp symptoms of intoxication and 0.15 mg/li proved to be the LD_{50} for cats. Inhalation of air containing an average of 0.003 mg/li of DDT was harmful to workers' health, the gravity of the poisonous effect increased with the DDT employment record. It is recommended that the maximal permissible DDT concentration in the air of working premises be set at 0.0001 mg/li or 0.1 mg/m^3.

F-4109

Shapiro, D. D. and I. Ya. Hetmanets
BLASTOMOGENIC PROPERTIES OF CRUDE OILS FROM DIFFERENT OIL FIELDS. Gigiena i Sanit., 27(6):38-41, June 1962. 2 refs. Translated from Russian by B. S. Levine in U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 268-271, 1966.
CFSTI: TT 66-61429

Results of the investigations show that crude oil coming from the Bitkov, Gozhansk, Romashkin, Radchenkov, and Kokaanov oil fields possessed blastomogenic properties. Results of the investigations show that the blastomogenic properties of the crude oils and of their derivative products differed to some extent with the concentration of paraffin contained in them. The results showed that the greater was the paraffin concentration in the crude oil, the more intensive was its blastomogenic activity. The same was true of the crude oil tar-pitch and of the crude oil cracking residue. The blastomogenic effects of crude oil derivative lubricating and cooling oils may be eliminated or greatly reduced; it is recommended that such oils be prepared from crude oil, the paraffin content of which originally was or was artificially reduced to less than 1 percent.

F-4110

Gimadeev, M. M.
THE ROLE PLAYED BY PARAFFIN IN THE BLASTOMOGENICITY OF CRUDE OIL. Gigiena i Sanit., 28(11):87-92, Nov. 1963. 28 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 272-278, 1966.
CFSTI: TT 66-61429

A critique is presented of "Blastomogenic Properties of Crude Oils from Different Oil Fields," Gigiena i Sanit., Vol. 27, No. 6, p. 38-41, June 1962 (APTIC 4109), by Prof. D. D. Shapiro and I. Ya. Hetmanetz.

F-4111

Kapkaev, E. A.
ORIENTATION DATA FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE ALPHA-METHYL STYROL CONCENTRATION IN THE AIR OF WORKING PREMISES. Gigiena i Sanit., 28(12):14-22, Dec. 1963. 27 refs. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 278-287, 1966.
CFSTI: TT 66-61429

Results of experimental, clinical and physiological studies had shown that alpha-methyl styrol had a definite effect on the central nervous and cardiovascular systems; its action on the peripheral blood produced mild polychromic anemia. Chronic exposure to the effects of alpha-methyl styrol may produce trophic and metabolic changes. Examination of workers in contact with alpha-methyl styrol vapor should include arterial pressure, mucous membranes of the upper respiratory tracts, and the peripheral blood picture. The presence of some upper respiratory diseases in applicant workers should be regarded as contraindicative to their employment requiring contact with alpha-methyl styrol vapor. Results of clinical observations showed weakening of the liver function; wherever this is the case workers should be carefully examined as a prophylactic measure against any possibility of toxic hepatitis development. It is recommended that 0.005 mg/li of alpha-methyl styrol be adopted as the maximal permissible concentration in the air of working premises.

F-4112

Roshchin, I. V.
HYGIENIC EVALUATION OF DUST FROM VANADIUM-CONTAINING SLAG. Gigiena i Sanit., 28(12):23-29, Dec. 1963. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 287-293, 1966.
CFSTI: TT 66-61429

It has been proven experimentally that Bessemer slag dust formed in processing Ural titano-magnatites chronically inhaled in concentrations of 30 to 100 mg/m^3 or more, may elicit pneumoconiosis. Productive changes developed only moderately and the process is a relatively benign one. Pneumoconiosis development is usually preceded by well defined changes in the mucous membrane of the respiratory tract, and by chronic bronchitis elicited by the slag dust. The coexistence of moderate roentgenological pneumoconiosis manifestiations and of well defined damaged mucous membrane of the upper respiratory tract, creates a picture of variable subjective and objective systems which distinguish slag dust pneumoconiosis from other pneumoconiosis types. Prevention of slag dust pneumoconiosis can be attained by a complex of special technical sanitary hygienic and therapeutic-prophylactic measures. It is recommended that 4 mg/m^3 of Bessemer slag dust be adopted as its maximal concentration in the air.

F-4221

Paribok, V. P. and F. A. Ivanova
AIR TEMPERATURES AND THE TOXIC EFFECTS OF NITROGEN OXIDES. Gigiena Truda i Professional'nye zabolevaniya (Moscow), 9(7):22-24, 1965. 16 refs. Translated from Russian. Fed. Proc. (Translation Supplement), 25(5) (Part 2):T851-T853, Sept.-Oct. 1966.

The influence of temperature on the toxicity of the nitrogen oxides to mice is reported. The nitrogen oxides were produced by the action of nitric acid on copper and the proportions of NO and NO_2 were estimated. The mice were exposed to various concentrations of nitrogen oxides over the temperature range 10 to 35°C in desiccators. The toxic effects were least at 15°C. There was less methemoglobin in the blood at high temperatures. The toxic effects of the nitrogen oxides are greater at high temperatures because of the disturbance of heat regulation and reduced oxygen consumption. At low temperatures the toxic effects are increased by increased methemoglobin formation and the disturbance of heat regulation.

F-4239

Pazynich, V. M.
MAXIMUM PERMISSIBLE CONCENTRATION OF VANADIUM PENTOXIDE IN THE ATMOSPHERE. [Eksperimental'nye dannye k gigienicheskomu obosnovaniyu predel'no dopustimoi kntsentratsii pyatiokisi vanadiya v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):6-12, July-Sept. 1966. 14 refs.

Experimental work on the mean-diurnal maximum permissible concentration of vanadium pentoxide in the atmosphere was carried out by a round-the-clock continuous poisoning of rats for 70 days. The effect of long-term exposure to vanadium pentoxide on the animals was evaluated from the following indices: general condition and weight of the animals, motor chronaxy of the antagonistic muscles, activity of blood cholinesterase, total serum proteins and serum protein fractions, oxyhemoglobin content in venous blood, and the fluorescence standard of blood leukocytes. After termination of the poisoning, the absorption of oxygen by minced liver tissue was studied with a Warburg apparatus. The results of the investigation led to the recommendation of 0.002 mg/m^3 as the mean diurnal maximum permissible concentration of vanadium pentoxide in the atmosphere.

F-4240

Al'terman, N. A. and S. F. Sorokina
DISEASE INCIDENCE IN UNDERGROUND WORKERS IN MERCURY MINES. [O zabolevaemosti podzemnykh rabochikh rtutnykh shakht.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):37-40, July-Sept. 1966. 8 refs.

The morbidity among the workers of mercury mines from 1961 to 1963 was studied. There was a high percent of incidence of bronchitis more often in combination with lung emphysema. Due to dust control measures taken, the dust content of the air in the mines fell sharply and the occurrence of silicosis decreased. (Authors' summary, modified)

F-4243

Petr, B. and P. Schmidt
EFFECT OF AIR POLLUTED WITH SULFUR DIOXIDE AND NITROGEN OXIDES. [Vozdeistvie na organizm atmosfernogo vozdukha, zagryaznennogo sernistym angidridom i okislami azota.] Hygiene and Sanitation (English translation of: Gigiena i Sanit), 31(7-9): 111-121, July-Sept. 1966. 14 refs.

An attempt was made to answer questions concerning the effect of atmospheric air polluted with sulfur dioxide and nitrous gases on the health of children living in such environments over long periods; to find out the nature of the combined chronic effect of these health hazards in the atmosphere, and to formulate preventive measures for reduction of the harmful effect of the polluted atmosphere. Investigations were carried out in two areas, in the environs of the towns Lovosice and Pardubice. In each area, three groups of children were studied living under very similar economic and climatic conditions, which differed only in the degree of atmospheric pollution. It was found that residence in an environment polluted by a mixture of both pollutants has more serious effects than a stay in an environment polluted mainly by one of them (SO_2), provided the ratio of the two substances is 1:1. If the nitrogen oxides are present in excess over the concentration of sulfur dioxide, the effect of the mixture is potentiated. If the concentration of sulfur dioxide is higher with respect to that of nitrous gases, the effects of the two mixture constituents are mutually neutralized and the effect of the mixture is attenuated.

F-4244

Kogan, F. M., S. Yu. Troitskii, and M. R. Gulevskaya
CARCINOGENIC EFFECT OF ASBESTOS DUST. [K voprosu o kantserogennom vliyanii asbestovoi pyli.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):218-225, July-Sept. 1966. 29 refs.

The mortality rate of lung cancer was studied for 10 years

(1953-1962) among workers dealing with asbestos and the rest of the population in the town as well as in all of the Sverdlovsk region. The mortality from lung cancer in the town was twice as high as that in the Sverdlovsk region. The finding was that the mortality from lung cancer among workers of the asbestos concentration plants was three times higher than among the rest of the population in the town. The standardized sex mortality rate among workers over 40 years old was 3.6 times higher than that among the rest of the population. The mortality rate among women workers dealing with asbestos was several times higher than that of the rest of the population. Lung cancer proved to be the cause of lethality in 9 percent of deaths among persons sick with asbestosis. The paper deals with a number of possible causes of augmented mortality from lung cancer among persons who have inhaled asbestos dust for a long time. (Authors' summary, modified)

F-4250

Makhinya, A. P.
HYGIENIC ASSESSMENT OF ATMOSPHERIC AIR POLLUTED BY SULFUR DIOXIDE WITH PHENOL. [Gigienicheskaya otsenka atmosfernogo vozdukha, zagryaznennogo sernistym gazom v sochetanni s fenolom.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):314-319, July-Sept. 1966. 6 refs.

The olfactory threshold for sulfur dioxide and phenol was investigated in 19 subjects. The SO_2 concentrations investigated were within the range of 0.22 to 3.2 mg/m^3. Of the 19 subjects, 10 perceived the SO_2 odor when the concentration was 0.88 - 0.87 mg/m^3. The minimum perceptible concentration of phenol was at a level of 0.022 mg/m^3, and the maximum sub-threshold concentration was 0.016 mg/m^3. The olfactory threshold for the combined presence of SO_2 and phenol was investigated with the assistance of the same 19 subjects. In the case of the 5 most sensitive subjects, this threshold was 0.44 mg/m^3 for SO_2 and 0.011 mg/m^3 for phenol, and in two cases it was 0.33 and 0.11 mg/m^3 respectively. A SO_2 concentration of 0.22 mg/m^3 and a phenol concentration of 0.005 mg/m^3 were not registered by the subjects. Three subjects were given adaptometric tests for three combinations of the substances under investigation. In all cases, SO_2 concentrations of 0.88-0.022 mg/m^3 and phenol concentrations of 0.44-0.011 mg/m^3 caused statistically significant changes in the sensitivity to light, while concentrations of 0.22 mg/m^3 SO_2 and 0.005 mg/m^3 phenol were ineffective. It is concluded that: The olfactory threshold was found to be 0.87 mg/m^3 SO_2 and 0.0022 mg/m^3 phenol in the most sensitive subjects. When both substances were present in the air together this threshold was 0.38 mg/m^3 for SO_2 and 0.011 mg/m^3 for phenol. The combined effects of the two substances were in the form of a simple summation. When both sulfur dioxide and phenol were present in the atmosphere their total maximum one-time concentration, expressed in fractions of their individual maximum permissible concentrations for their separate presence, should not exceed unity. The mean diurnal maximum permissible concentrations for the combined presence of sulfur dioxide and phenol in the atmosphere is recommended at a level of 0.05 mg/m^3 for sulfur dioxide and 0.005 mg/m^3 for phenol.

F-4251

Petrova, N. V. and T. S. Lisunova
LEAD CONTENTS IN THE AIR OF IRON MINES EMPLOYING SHORT-DELAY ELECTRIC BLASTING CAPS (DETONATORS). [Soderzhanie svintsa v vosdushnoi srede zhelezorudnykh shakht pri primenenii elektrodetonatorov korotkozamedlennogo deistviya.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):326-327, July-Sept. 1966.

In the mines of the Krivoi Rog iron-ore basin, the blasting is mainly done with short-delay electric blasting caps. They contain lead compounds which may pollute the air in the mine. In 63 to 68 percent of the air samples taken in mine workings, the lead contents were above the maximum permissible concentration, varying from 0.02 to 0.057 mg/m^3, an average of 0.13 mg/m^3. Such high concentrations were due to unsatisfactory ventilation. An improvement in the ventilation of dead-end faces may lead to a reduction in the lead content in the air down to maximum permissible concentration and even lower. This is shown by the fact that lead was not discovered or else did not exceed the maximum permissible concentration in 33 to 37 percent of the samples. According to the investigations, in the case when the ventilation was improved so as to satisfy the standard requirements, the lead concentration was reduced to the maximum permissible level (0.01 mg/m^3). Periodic medical examinations of miners must include tests for lead poisoning.

F-4252

Partsef, D. P.
CHRONIC EFFECT OF CERTAIN COMPONENTS OF EXHAUST GASES FROM MOTOR CARS. [Khronichesko deistvie na organizm zhivotnykh nekotorykh komponentov vykhlopnykh gazov avtomobilei.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):363-368, July-Sept. 1966. 7 refs.

Analysis of the motor-car exhaust gases and of the air of the highways by separate chromatographic methods revealed comparably high concentrations of pentane and hexane. Their concentration in the atmosphere attained 4 mg/m^3 and their ratio was about 1:1. A 24-hour poisoning of albino rats for a period of 86 days showed that pentane and hexane at concentrations of 94.7, 50 and 10 (at a ratio of 1:1) had no significant effect on the animal's body and it was only at a concentration of 3 mg/m^3 that they had no effect at all on the behavior of the animals, their weight, the motor chronaxy of muscle antagonists, the blood pressure and the cholinesterase level. (Author's summary)

F-4253

Dmitrieva, N. V.
MAXIMUM PERMISSIBLE CONCENTRATION OF TETRACHLOROETHYLENE IN FACTORY AIR. [Materialy k obosnovaniyu predel'no dopustimoi kontsentratsii tetrakhloretilena (perlena) v vozdukhe proizvodstvennykh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):387-392, July-Sept. 1966. 4 refs.

The toxicity of tetrachloroethylene was investigated with a view to formulating hygienic standards. Acute and chronic exposure studies were conducted on rats using varying concentrations of the compound. The effects were investigated by electrophysiological, biochemical, and histological methods. Based on the results of these studies, it was recommended that the maximum permissible concentration of tetrachloroethylene in factory air should be 0.03 mg/l.

F-4258

Frolova, I. N.
MAXIMUM PERMISSIBLE CONCENTRATION OF P-CHLOROPHENYL ISOCYANATE IN FACTORY AIR. [Materialy

k obosnovaniyu predel'no dopustimoi kontsentratsii para-khlorfenilizotsianata v vozdukhe proizvodstvennykh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.). 31(7-9):481-483, July-Sept. 1966. 2 refs.

The effects of p-Chlorophenyl isocyanate were studied in experiments of 152 white mice, 22 albino rats and 4 rabbits. The substance was found to be toxic with respect to laboratory animals when inhaled or ingested, whereas its toxicity was only slight in the case of cutaneous application. The median lethal concentration for inhalation by white mice was 0.053 ± 0.0034 mg/l (0.061 to 0.045 mg/l). Its threshold concentration for rabbits, determined from variations in the characteristics of the unconditioned reflex, was found to be 0.003 mg/l, with an increase in the time necessary for the development of the reflex muscle strain. Experiments on the inhalation of PCIC were performed by the dynamic method. Since the liminal and the subliminal concentrations of the substance in question were found to be 0.0008 mg/l and 0.0005 mg/l, respectively, as determined from its irritating effects (tested on human volunteers), it was possible to recommend a tentative maximum permissible concentration of PCIC at the level of 0.0005 mg/l.

F-4480

Vasil'yev, L. L.
THEORY AND PRACTICE OF IONIZED-AIR THERAPY. Leningradskogo Gosudarstvennogo Universiteta imeni A. A. Zhdanova, Leningrad. 1951. 63 refs. Translated from Russian. Foreign Technology Division, Wright-Patterson AFB, Ohio, Jan. 6, 1966. 142p.

The aim was to make the numerous special works on aeroionization readily accessible to the ordinary reader. The brochure is intended mainly for physicians and biologists, but may prove to be understandable and not without interest for every sufficiently educated reader. Moreover, an attempt has been made to present the factual and theoretical material on questions of aeroionization and aeroiontherapy, but also to teach as far as possible how to work experimentally in this promising area of knowledge. Parts of this paper are under the headings: (1) Natural Ionization of Air, its Climatological and Hygienic Significance, (2) Artificial Ionization of Air. Aeroion Generators and Counters, (3) Therapeutic Use of Aeroinoization (Aeroiontherapy), (4) Experimental Bases of Aeroiontherapy and (5) Paths and Mechanisms of the Physiological Effect of Aeroions.

F-4676

Kogan, F. M.
ASBESTOS DUST AND LUNG CANCER. [Asbestovaya pyl' i rak legkikh.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 29(7):96-102, July 1964. 45 refs.

The majority of authors have revealed a higher percentage of lung cancer in the bodies of persons who had asbestosis than in those of persons who had no association with asbestos or who had silicosis. The majority of these patients were 55 to 60 years old; they had worked 20 years or more in the asbestos industry. In persons working with asbestos a high incidence of serous pleural tumors as well as neoplasms with an extrapulmonary localization are noted. At the asbestos mines in Canada, the mortality rate of workers from lung cancer is higher than the lung cancer mortality rate for the general public. A marked tendency toward the formation of neoplasms was noted in animals which were covered with asbestos dust; in these cases it was noted that not only the long asbestos fibers can exert such an effect. In the Soviet literature to date this problem has not been studied.

F-4708

Neimann, I. M.
CARCINOGENIC CHEMICAL SUBSTANCES IN THE ENVIRONMENT. [O kantserogenno deistvuyushchikh khimicheskikh veshchestvakh v okruzhayushchei srede.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 29(12):87-93, Dec. 1964. 25 refs.

This review of the carcinogenic substances generally present to some degree in man's everyday environment lists the following examples and situations: (1) air quality and the fact that statistics disclose that there is a greater occurrence of lung cancer in cities than in less smoke polluted areas; (2) smoking and the fact 3,4-benzopyrene, a carcinogen found in polluted city air, is also to be found in cigarette smoke; (3) contamination of foodstuffs with processing chemicals; (4) apparatus with rubber parts which may have been stabilized with soot, which upon aging may disintegrate and contaminate food stuffs, as in the case of milking machines; (5) carcinogenicity of certain drugs; and (6) hydrocarbons present in coal and petroleum. Ways of identifying carcinogens or the carcinogenicity of a substance are discussed and include spectrographic and biological methods.

F-4929

Andreeva-Galanina, E. Ts. and Z. Z. Bruskin
EFFECTS OF INHALED OIL AEROSOLS ON THE BODY (A BRIEF REVIEW OF THE LITERATURE). [O vliyanii maslyanykh aerozolei na organizm pri vdykhanii. Kratkii obzor literatury.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 29(3):85-89, March 1964.

Despite the extensive use of lubricating oils in industry and the large number of studies of the oil mists in the atmosphere, there is very little information concerning the effect of the latter on the body. From the Soviet literature it is well known that particles of an oil aerosol penetrate deeply into the respiratory tract. At the same time, the world literature has in it many papers on the effects of oil mists on the deep portions of the respiratory tract. Some of the findings of these investigations are discussed.

F-5044

Kozlov, V. M. and V. D. Turovskiy
BERYLLIUM TOXICOLOGY, SYMPTOMATOLOGY OF AFFECTIONS AND INDUSTRIAL HYGIENE. [Berilliy Toksikologiya, Klinika Porazheniy, Gigiyena Truda.] In: Gosudarstvennoye Izdatel'stvo Literatury V Oblasti Atomnoy Nauki i Tekhniki, 1962. Translated from Russian. Foreign Technology Division, Wright-Patterson AFB, Ohio, Oct. 24, 1963, 162p.

The book describes the problems of the toxicology of beryllium, the symptomatology of affections caused by the action of this compound, industrial hygiene for beryllium production, and the protection of the environment from contamination with production wastes. Sanitary-hygienic requirements have been worked out for the designing of production areas, for the various types of equipment used, and for industrial ventilation systems. The sanitary-hygienic requirements described in this book apply primarily to the production of beryllium and components fabricated from this metal and to enterprises or shops which produce beryllium-rich alloys of other metals. These requirements cannot be completely extended to the production processes by which alloys containing only small quantities of beryllium are obtained and to work associated with the fabrication of components from such alloys. The book is for a wide range of medical specialists, engineering and technical inspectors from the professional associations, and workers employed in beryllium production.

F-5122

Petri, Heinz
THE EFFECTS OF HYDROGEN SULFIDE AND CARBON DISULFIDE. [Wirkungen von Schwefelwasserstoff und Schwefelkohlenstoff.] STAUB, 21(2):64-68, Feb. 1, 1961. Translated from Russian. Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, 13p.

Some of the sources of air contamination by hydrogen sulfide and carbon disulfide are discussed. A survey is given, through review of previous investigations, of the mechanisms of the biological effects of these compounds. Among these effects are: interference with respiratory enzymes; effects in the blood; enzyme poisoning; alteration of the functioning of the cerebral cortex; and disturbance of cell metabolism. Sensitivity to the odors of these compounds and synergistic effects are also discussed. Thresholds, from odor through appearance of symptoms to death, are tabulated.

F-5182

Arkhipov, A. S.
TECHNICAL PROGRESS IN THE CHEMICAL INDUSTRY OF THE U.S.S.R. AND LABOR HYGIENE. In: Gigiyena Truda i Professional'nyye Zabolevaniya, Vol. 11, p. 3-8, 1963. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 1-7, Feb. 3, 1964.
CFSTI: 64-21468

A discussion of trends marking technical progress in the chemical industry of the U.S.S.R. and its influence upon hygienic aspects of work conditions is presented. Data are presented covering introduction of new techniques, apparatus, installations, new technological processes, measures on automation, mechanization, remote control of technological processes, and the effects all these measures exert on the concentration level of toxic substances in the inside atmosphere of chemical plants. The further development of technical process in the chemical industry requires closer coordination of the operations of planning and technological institutes with the institutes of hygiene and the chairs of labor hygiene. It is advisable to work out the new technical processes and equipment for the chemical industries with the aid of qualified hygienists in this work, which will make it possible to take into consideration a number of important hygienic requirements for the construction and development of new technical equipment for the chemical industry.

F-5185

Kiryakov, K.
CHANGES IN THE CEREBRAL BIOELECTRICAL ACTIVITY IN WORKERS FROM THE EFFECT OF MERCURY. Gigiyena Truda i Professional'nyye Zabolevaniya, No. 11, p. 60-64, 1963. 9 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 17-22, Feb. 3, 1964.
CFSTI: TT 64-21468

The effect of mercurial vapors can bring about certain changes in the cerebral cortical bioelectrical activity expressed chiefly in low voltage and incomplete or partially dominant desynchronization (fast rhythm). These changes are related to the duration of industrial contact with mercury. In most persons who were healthy, the electroencephalograph pattern showed no changes. The EEG changes in some persons who were healthy can constitute a sign that the earliest manifestations of the toxic effect are beginning. The EEG method should be used simultaneously with other clinical and laboratory methods for purposes of early diagnosis of mercurial neurointoxications.

F-5231

Gurinov, B. P., V. N. Tugarinova, O. I. Vasil'yeva, M. V. Nifontova, and L. M. Shabad
THE CARCINOGENIC PROPERTIES OF EXHAUST GAS SOOT OR MOTOR TRANSPORT. Gigiena i Sanit., 27(2): 19-24, 1962. 10 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., p. 1-7, May 8, 1962.
CFSTI: TT 62-24732

At the present time it is well known that in atmospheric air, products of incomplete combustion of fuel may be present, in which there are carcinogenic hydrocarbons. Among them the most common and best studied is 3,4-benzpyrene, which possesses a strong carcinogenic effect. Among the sources of contamination of the air with this carcinogen the exhaust gases of motor transport occupy one of the leading places. The objects of this study were samples of soot scraped from the inner surfaces of exhaust pipes of automobiles with carburetor motors operating on gasoline and of trucks with diesel motors operating on solar oil. As experimental animals, use was made of mice of the black C_{57} and brown CC_{57} strains. Two procedures were used: cutaneous applications and subcutaneous injections. Tar was applied to the skin in a 20 percent benzol solution in a dose of two drops in the interscapular region over an area of 1 to 1.5 centimeters three times a week. The tar applications were continued until the animals died. The results obtained led to the conclusion that the soot of exhaust gases of motor transport with carburetor motors possesses a blastomogenic effect, which the same soot from diesel engines does not possess.

F-5238

Konstantinova, A. I. and N. D. Chertova
LUNG CANCER MORBIDITY IN RELATION TO AIR POLLUTION. Klinich. Med., 40(12):104-106. 2 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 4p., Feb. 7, 1963.
CFSTI: TT 63-21071

In recent decades a considerable rise in the lung cancer morbidity and mortality rates has been noted throughout the world. A factor which plays a large role in the etiology of this disease, is contamination of the air with dust containing carcinogenic substances. In view of the fact that the air in the industrial section of Ufa is contaminated with the discharges of petroleum refineries and chemical and machine-building plants, it was decided to study the effect of the environment upon the occurrence of lung cancer in the clinic. Case histories of illness and statistical data on lung cancer morbidity and mortality were studied over a period of 10 years. The data show that the lung cancer mortality rate among individuals over 29 years of age is higher in the industrial section of the city.

F-5239

Kovalenko, Ye. A., V. L. Popkov, and I. N. Chernyakov
OXYGENATION OF BRAIN TISSUES DURING AIR AND OXYGEN RESPIRATION WITH AN ADMIXTURE OF CO_2. Fiziol. Zh. SSSR, 50(2):177-182, 1964. Translated from Russian. Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio, 11p., Nov. 23, 1964.

A mixture of oxygen and carbon dioxide, rather than pure oxygen, has been recommended for the treatment of hypoxia. However, the basic problem regarding the change in oxygenation of brain tissue which may occur under the combined effect of hyperoxia and hypercapnia has not been resolved. In the present investigations, data are presented on the dynamics of oxygen tension in brain tissue under respiration of gas mixtures with an increased oxygen and carbon dioxide content. Platinum electrodes were implanted in the brains of dogs and the oxygen tension in various parts of the brain was measured by polarography. In a number of the experiments, the following were also recorded: pneumogram, pulmonary ventilation, E.M.G. of the abdominal muscles, E.C.G., E.E.G., and blood pressure in the femoral artery. The oxygen tension in the cortex and subcortex during respiration with 5 percent and 10 percent CO_2 increased up to 125 percent and 160 percent, respectively, whereas pure oxygen caused an increase of 1.5 to 2 over the original. The data obtained from these experiments confirmed the value of using hydrogen respiration with CO_2 in the treatment of oxygen deficiency of the cerebrum.

F-5255

Retnev, V. M.
THE SIGNIFICANCE OF DUSTS IN THE ETIOLOGY OF THE SO-CALLED GENERAL (NONSPECIFIC) MORBIDITY AMONG WORKERS. Gigiena i Sanit., 27(9):82-85, Sept. 1962. 18 refs. (Presented at the International Scientific Conference on Industrial Hygiene and Occupational Diseases, Halle, Germany, Nov. 17, 1961.) Translated from Russian. Office of Technical Services, U.S. Dept. of Commerce, Washington, D. C., 6p., 1963.
CFSTI: TT 63-16985

Clinical statistics demonstrate an increase in the rates of non-specific illnesses in workers due to dusts. The incidence of such respiratory ailments as sore throat, common cold, bronchitis, pleurisy, and others is significantly higher among workers exposed to dusts than it is among other workers. These facts emphasize the importance of reducing occupational exposure to dusts.

F-5272

Zinger, E. E.
THE INCIDENCE OF PNEUMOKONIOSIS IN MINES OF THE DONETS COAL FIELDS WITH DIFFERENT GEOLOGICAL CHARACTERISTICS. [Rasprostrannenost' pnevmokoniosa v shakhrakh Donbassa a razlichnymi gornogeologicheskimi usloviyami.] Materialy 13 (Trinadtsatogo) Plenuma Resp. Komis. po Bor'be s Silikozom, Akad. Nauk Udr. SSR, 1961. p. 100-108. 13 refs. Translated from Russian. Office of Technical Services, Dept. of Commerce, Washington, D. C., 12p., June 1963.
CFSTI: TT 64-13368

Data on the incidence of pneumoconiosis in the mines of the Stalino district lead to the following conclusions: the incidence of pneumoconiosis is highest in mines with steeply inclined seams. The lowest indices of pneumoconiosis are found in mines with gently sloping seams of bituminous coals. In this respect, anthracite mines occupy an intermediate position. The highest attack rate, and earliest development of pneumoconiosis, is among coal-getters in mines with steeply inclined seams, and among the cutter-loader operators and coal cutter operators in mines with gently inclined seams. The incidence rate, time of onset, and rate of progression of pneumoconiosis among workers from the different categories of mines were determined chiefly by the total amount of dust inhaled. Having regard to the period of earliest onset of pneumoconiosis and to its incidence among underground workers of different job-categories the following time-table for radiography and periodical medical examination is recommended: In mines with steeply sloping seams: a) for men engaged in getting and winning, at 3 to 4 years service; b) for men working under conditions of little dust, beginning at 7 to 8 years service; c) for all other underground workers, beginning at 15 years service. In mines with gently sloping seams: a) for men engaged in getting and in winning, beginning at 5 to 6 years; b) for those exposed to little dust, beginning at 10 years; c) for all other underground workers, beginning after 15 years.

F-5735

Malykhin, V. M., A. A. Moiseev, and V. P. Shamov
HUMAN BIOLOGICAL DOSE FROM INTERNAL RADIATION PRODUCED BY SR^{90}. Soviet J. At. Energy (English Translation), 19(4):1350-1352, Oct. 1965. 6 refs.

Calculations of the accumulation of Sr^{90} in the body of the "standard" man and of the skeletal burden as a function of the time of intake of Sr^{90}, along with food, play an important role in predicting the internal radiation levels of the population in future years in association with the observed clearing of nuclear test products from the atmosphere. To simplify such calculations, one can assume that the deposition of Sr^{90} from the atmosphere is basically complete at the time selected for the beginning of the reporting period and that contamination occurs mainly by plant uptake of Sr^{90} from the soil through the root system. Further it is assumed that the Sr^{90} content in objects in the environment decreases exponentially. Because of the complexity of the calculations, washout of Sr^{90} from the soil is not taken into account. The coefficients which are computed make it possible to determine the tissue dose for arbitrary levels of the Sr^{90} content in the food ration, the initial Sr^{90} content in the food ration, or of the amount of that isotope in the body at time of measurement and they can be used for predicting irradiation of the skeleton by Sr^{90} which has been deposited in global radioactive fallout.

F-5891

Spodenkiewicz, T. and A. Gawronski
METHOD FOR DETERMINING RADON (RN-222) IN AIR EXHALED. Nukleonika, 10(3):135-194, 1965. 18 refs. Translated from Polish. Scientific Publications Foreign Cooperation Center of the Central Institute for Scientific, Technical, and Economic Information, Warsaw, Poland, p. 27-37, 1965.
AEC: tr-6489

A method for determining Ra-226 in the body was developed, based on the determination of Rn-222 in the air exhaled. Instrumentation included two 10-liter ionization chambers used in conjunction with a string electrometer connected in a compensation system. Measurements were carried out with 30 individuals occupationally unexposed to ionizing radiation. The data obtained was used for estimation of the detectability of the method; this was found to be 0.08 x

10 to the -7th power c Ra-226 in the body. The body burden of Ra-226 was determined in 154 individuals operating with luminous paints containing this element. The burden established did not exceed the maximum permissible body burden of Ra-226. (Authors' abstract, modified)

F-5941

Melekhina, V. P.
HYGIENIC EVALUATION OF FORMALDEHYDE AS AN ATMOSPHERIC AIR POLLUTANT. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):9-18, 1962.
CFSTI: TT 64-11574

Formaldehyde is discharged into the atmosphere by many industrial enterprises; therefore, it is important that a study of formaldehyde vapor effect on the human organism be reliably determined. Concentration of threshold formaldehyde vapor odor preception for most sensitive persons was 0.07 mg/m^3. Concentration of threshold formaldehyde reflex effect, as determined by the method of optical chronaxy, was 0.08 mg/m^3, and 0.1 mg/m^3 as determined by the method of dark adaptation. It was suggested that 0.035 mg/m^3 of formaldehyde vapor in atmospheric air of inhabited areas be accepted as its maximal single concentration, with provision for a safety coefficient. The atmospheric air in the vicinity of the plants under investigation contained formaldehyde vapor concentrations in excess of the allowable concentration limits at a distance of 1,000 m from the point of its discharge. It was recommended that sanitary clearance zones be established around such industrial plants which have no gas purifying equipment as follows: of not less than 1,000 m for plants producing up to 50 tons of formalin in 24 hours, and not less than 400 m around plants producing galalith. No formaldehyde trapping installations were in use up to the present, which raises the problem of developing formaldehyde trapping equipment. The physiochemical properties of formaldehyde suggest that the advisability of using scrubbers for formaldehyde trapping be rechecked. The presence of formaldehyde in Diesel engine exhaust gases must be taken into consideration in developing means for the protection of atmospheric air against automobile exhausts and industrial plant discharges. The study of formaldehyde concentration in automobile exhaust gases also raises the problem of developing technological means for the elimination of aldehyde formation by internal combustion engines and for the purification of engine exhaust before it is thrown into the atmospheric air.

F-5942

Elfimova, E. V.
DATA FOR THE HYGIENIC EVALUATION OF HYDROCHLORIC ACID AEROSOL (HYDROCHLORIC GAS) AS AN ATMOSPHERIC POLLUTANT. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 14 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):18-28, 1962.
CFSTI: TT 64-11574

It was shown that 0.1 mg/m^3 is the concentration of threshold hydrochloric acid aerosol odor perception, that 0.05 mg/m^3 is the odor non-perceptible concentration, that 0.6 mg/m^3 is the concentration of threshold reflex effect on optical chronaxy, and 0.2 mg/m^3 the concentration of threshold reflex effect on eye sensitivity to light. The concentration of threshold effect on digito-vascular tonicity is 0.5 mg/m^3, and the threshold concentration of change in the rhythm and depth of respiratory movement is at 0.1 mg/m^3 of the aerosol. On the basis of the above results it is recommended that 0.05 mg/m^3 be accepted as the limit of allowable single concentration of hydrochloric acid aerosol in atmospheric air. Results of this investigation indicated that 10 mg/m^3 of the aerosol, representing the limit of allowable concentration for working premises, elicited sharp shifts in the physiological reactions. The method used for the determination of hydrochloric acid aerosol in atmospheric air can be applied to the determination of the aerosol in the presence of H_2SO_4 aerosol and in the presence of free chlorine and chlorides. The present investigation indicated that atmospheric air in the vicinity of a magnesium plant is highly polluted with hydrochloric acid aerosol, that such air pollution extended over considerable distances from the magnesium plant, and that the sanitary protection zones around magnesium plant discharging hydrochloric acid aerosol, in the absence of gas purifying equipment, should be in excess of 3,000 m. Plans for future magnesium plants should mandatorily include provisions for the installation of hydrochloric acid absorbing equipment.

F-5943

Gil'denskjol'd, R. S.
A RESTUDY OF THE MAXIMAL ALLOWABLE SINGLE CONCENTRATION OF CARBON DISULFIDE IN ATMOSPHERIC AIR. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Dontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 21 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):29-39, 1962.
CFSTI: TT 64-11574

Examinations of air samples indicated that, even at 3000 meters from the investigated plant, the air contained 0.03 mg/m^3 of carbon disulfide. Results of tests conducted with the aid of most odor perception sensitive persons indicated that 0.05 mg/m^3 is the concentration of threshold odor perception for CS_2 and that 0.04 mg/m^3 is the odor nonperceptible concentration of CS_2. The concentration of threshold carbon disulfide reflex effect, as determined by the method of optical chronaxy, is 0.04 mg/m^3 and the subthreshold concentration is 0.03 mg/m^3. The limit of allowable CS_2 concentration should not exceed 0.03 mg/m^3. Results of the present investigation suggest that the present 2000 m width of sanitary clearance zones surrounding viscous plants should be widened to 3000 m. Sanitary bodies must insist on the immediate installation of effective equipment for the purification of viscous combine gas discharges containing CS_2. Gases discharged by viscous plants contain vapors other than CS_2. It is, therefore, suggested that a comprehensive and complex study of the atmospheric air in vicinities of viscous plants be initiated without undue delay.

F-5944

Kokuchaev, V. F. and N. N. Skvortsova
ATMOSPHERIC AIR POLLUTION WITH MANGANESE COMPOUNDS AND THEIR EFFECT ON THE ORGANISM. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 14 refs. Translated from Russian by B. S. Levine,

U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):40-46, 1962.
CFSTI: TT 64-11574

The present investigation was condusted along the following three lines: (1) A study of atmospheric air pollution with industrial manganese discharges. (2) Effects of manganese plant discharges on the health and living conditions of nearby residents; and (3) Effect of low manganese concentrations on the organism. Atmospheric air studies were conducted in the vicinity of a metallurgical plant smelting pig iron and ferromanganese. Production of ferromanganese is a source of considerable and continuous air pollution with toxic discharges as far as 3 km from the source of discharge. Air pollution with industrial ferromanganese discharges brought about complaints from nearby residents about deterioration of sanitary hygienic conditions and of general well-being. Increased respiratory system morbidity among children of residents has been connected with manganese and ferromanganese plant discharges. Sanitary clearance zones of 500 m, prescribed for metallurgical plants similar to the one investigated were inadequate for the intended sanitary protection and should be increased to 2 km; in addition, effective dust catching equipment should be installed without delay.

F-5945

Kurnosov, V. M.
SUPPLEMENTAL DATA ON THE ACCUMULATION AND DISTRIBUTION OF MERCURY IN THE ORGANISM OF EXPERIMENTAL ANIMALS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 20 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):47-54, 1962.
CFSTI: TT 64-11547

Chronic experiments were conducted for the determination of the effect of 0.002 - 0.005 mg/m^3 mercury vapor on the organism. Chronic exposure to the effect of mercury vapor in concentrations at times found in atmospheric air adversely affected the organism by disturbing the functional activity of higher nervous centers, by excessive deposition of mercury in the organs and especially in the brain, and by producing pathomorphological changes. The extent and gravity of the neurological and pathomorphological changes were directly proportional to the mercury vapor concentration in the inhaled air. Experimental exposure of animals to the inhalation of mercury vapor in concentrations below the limit of allowable concentration in atmospheric air elicited none of the above described pathological symptoms. This confirms the conclusion previously arrived at, namely, that 0.0003 mg/m^3 of mercury vapor should be regarded as the limit of its allowable concentration in atmospheric air. Results of the present investigation showed that chronic exposure to mercury vapor in concentrations of 0.008 - 0.01 mg/m^3, resulted in the deposition of mercury in organs and brain tissues, which disturbed the higher central nervous activity centers and other organs, accompanied by pathomorphological changes. Therefore, it is suggested that the existing limit of allowable mercury vapor concentration for air of working premises is ill founded and should be revised after appropriate investigation.

F-5946

Stayzhkin, V. M.
HYGIENIC DETERMINATION OF LIMITS OF ALLOWABLE CONCENTRATIONS OF CHLORINE AND HYDROCHLORIDE GASES SIMULTANEOUSLY PRESENT IN ATMOSPHERIC AIR. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 17 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):55-61, 1962.
CFSTI: TT 64-11574

This study was confined to the use of low concentrations of chlorine and hydrochloride gases and their effect on the physiological reactivity of man. The methods of investigation were: determination of threshold odor perception, optical chronaxy and adaptometry. Results of this investigation indicated that 0.75 mg/m^3 was the concentration of threshold chlorine odor perception, and 0.02 mg/m^3 the concentration of threshold hydrochloride gas odor perception. The simultaneous presence in the air of chlorine and hydrochloride gases was not odor perceptible when the gases co-existed in the following ratio concentrations: 0.3 mg/m^3 of chlorine and 0.1 mg/m^3 of hydrochloride gas, also 0.2 mg/m^3 of chlorine and 0.13 mg/m^3 hydrochloride gas. The additive physiological and neurological effects of simultaneously present chlorine and hydrochloric gases in the air were in the nature of arithmetical summation. Optical chronaxy tests indicated that threshold reflex effects were produced by chlorine and hydrochloride gas simultaneous present in the air in the following ratio combinations: chlorine, 0.3 mg/m^3 and hydrochloride gas, 0.3 mg/m^3 and also chlorine, 0.3 mg/m^3 and hydrochloride gas, 0.3 mg/m^3. Tests of eye sensitivity to light indicated that the combination of 0.2 mg/m^3 of chlorine and 0.1 mg/m^3 of hydrochloride gas constituted a threshold combination mixture of the 2 gases which elicited changes in eye sensitivity to light. The present investigation also indicated that the previously adopted limits of allowable single chlorine concentration of 0.1 mg/m^3 and of hydrochloride gas of 0.005 mg/m^3 simultaneously present in atmospheric air were below the threshold of odor perception and of effect on reflex activity.

F-5947

Fel'dman, Yu. G.
ACETONE AS AN ATMOSPHERIC AIR POLLUTANT. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 29 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):62-72, 1962.
CFSTI: TT 64-11574

It was found in this study that 1.1 mg/m^3 is the concentration of threshold acetone vapor odor perception in most sensitive persons, and that 0.8 mg/m^3 is the odor nonperceptible concentration. 0.55 mg/m^3 is the concentration of threshold acetone reflex effect on the functional state of cerebral cortex, as determined by the adaptometric method. 0.44 mg/m^3 is the subthreshold concentration. The concentration of threshold acetone reflex effect on the formation of electrocortical conditioned reflexes is 0.44 mg/m^3, and the maximal inactive concentration is 0.35 mg/m^3. Chronic inhalation of an average acetone vapor concentration of 199 mg/m^3, 8 hours daily for 45 days produces motor chronaxy changes in the experimental animals. Continuous 45 day inhalation of an average acetone vapor concentration of 0.53 mg/m^3 produces no clearcut changes in the animals' motor chronaxies. Motor chronaxy curves of the control animal are practically identical with those noted in experimental animals which inhaled 199 mg/m^3 and also 0.53 mg/m^3 of acetone vapor uninterruptedly for 45 days. This is also true of the blood picture, of the animal's weight, and histologic pictures of the internal organs. The limits of allowable single and average 24-hour concentrations should not exceed 0.35 mg/m^3. The atmospheric air in the vicinity of the investigated acetate silk plant is systematically polluted with acetone, the concentrations of which exceed the recommended allowable limit even at 600 m from the plant. The 100 m sanitary clearance zone established for acetate silk producing plants is inadequate and should be increased to 750 m, especially where the acetone discharge averaged 4.5 tons per day.

F-5948

Shul'ga, T. M.
NEW DATA FOR THE HYGIENIC EVALUATION OF CARBON MONOXIDE IN ATMOSPHERIC AIR. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 22 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):73-31, 1962.
CFSTI: TT 64-11574

A study on the inhalation of air containing 20 mg/m^3 of carbon monoxide showed no detectable effect on the receptors of the respiratory organs. Inhalation of air containing 29 mg/m^3 of CO 8 hours daily for 10 days (chronic) produced in the experimental animals significant changes in motor chronaxy, depressed porphyrin metabolism, and elicited gross changes in brain tissue. Inhalation of 2.4 mg/m^3 of CO uninterruptedly for 10 weeks (chronic) produced no visible changes in motor chronaxy, depressed the porphyrin metabolism and produced reversible morphologic changes in individual nerve cells of the brain. The limit of allowable average 24-hour carbon monoxide concentration in atmospheric air should not exceed 1 mg/m^3. The present limit of allowable carbon monoxide in the air of working premises, namely, 0.03 mg/li, or 30.0 mg/m^3, is too high, and should be lowered.

F-5949

Solomin, G. I.
HYGIENIC EVALUATION OF DINYL AS AN ATMOSPHERIC AIR POLLUTANT. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 6.] V. A. Ryazanova (ed.). 15 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1):82-92, 1962.
CFSTI: TT 64-11574

Results of odor perception study conducted with 15 persons indicated that the concentration of threshold dinyl vapor odor perception was 0.06 mg/m^3 and that the concentration of threshold dinyl reflex effect on eye sensitivity to light was 0.04 mg/m^3. The concentration of threshold dinyl electrocortical conditioned reflex formation was 0.03 mg/m^3, and the subthreshold concentration was 0.01 mg/m^3. The maximal single allowable dinyl vapor concentration for atmospheric air should not exceed 0.01 mg/m^3. Dinyl concentrations of 10 and 0.2 mg/m^3 under conditions of chronic vapor inhalation elicited changes in the muscle antagonist's chronaxy in white rats. Rate of coproporphyrin elimination with the urine was lowered in rats which chronically inhaled 10 and 0.2 mg/m^3 of dinyl vapor. Prolonged inhalation of air containing 10 mg/m^3 of dinyl lowered cholinesterase activity, while inhalation of 0.2 mg/m^3 under similar conditions enhanced cholinesterase activity. Inhalation of air containing 10 and 0.2 mg/m^3 by rats increased the number of leucocytes and decreased the number of lymphocytes. Chronic 24-hour inhalation by rats of air containing 0.01 mg/m^3 of dinyl vapor for a period of 70 days had no effect on the rats' functional activities noted in rats inhaling air having higher dinyl vapor concentrations. The limit of average 24-hour dinyl vapor concentration in atmospheric air could be the same as the limit of maximal single concentration, i.e., 0.01 mg/m^3. Sanitary clearance zones surrounding capronic plants which discharge up to 6 tons of dinyl per month should not be less than 800 m wide.

F-5953

Ubaidullaev, R.
ATMOSPHERIC AIR POLLUTION WITH FURFUROL AND ITS HYGIENIC EVALUATION. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 7.] V. A. Ryazanova (ed.). 27 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2):142-154, 1963.
CFSTI: TT 64-11574

The extensive use of furfurol in the U.S.S.R. national economy and the consequent pollution of air with this vapor made it imperative that a restudy be made of its sanitary significance and an exact determination be made of its limit of allowable concentration in the air. The atmospheric air surrounding plants, producing or using furfurol was polluted by furfurol vapor. The concentration of threshold furfurol odor perception in most odor sensitive persons was determined as 1 mg/m^3, of eye sensitivity to light as 0.31 mg/m^3 and for the development of electrocortical conditioned reflexes as 0.084 mg/m^3, 0.05 mg/m^3 of furfurol constituted a nonactive concentration. The proposed maximal single allowable furfurol concentration in atmospheric air was 0.05 mg/m^3. Chronic 24-hour exposure to furfurol vapor at concentrations of 10 and 0.33 mg/m^3 for 60 days elicited in experimental rats shifts in the flexor and extensor chronaxy ratios, in the cholinesterase activity and in the blood serum protein fraction picture. In 0.05 mg/m^3 concentration furfurol had no effect on the organism of the experimental rats. The recommended average 24 hour allowable concentration limit of furfurol in atmospheric air according to results obtained with chronic experiments was 0.05 mg/m^3.

F-5954

Shen, L.
EXPERIMENTAL DATA FOR THE HYGIENIC EVALUATION OF ATMOSPHERIC AIR POLLUTION WITH STYROL. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 7.] V. A. Ryazanova (ed.). 17 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2):155-168, 1963.
CFSTI: TT 64-11574

The results obtained from the hygienic evaluation of atmospheric styrol showed the following: (1) The concentration of threshold styrol vapor odor perception in most sensitive persons was 0.02 mg/m^3, and the subthreshold non-perceptible concentration was 0.01 mg/m^3; (2) The threshold effect on reflex changes in eye sensitivity to light in response to styrol inhalation was the same as the threshold of odor perception, namely 0.02 mg/m^3; (3) The threshold styrol concentration capable of forming electrocortical reflexes was 0.005 mg/m^3; and (4) The recommended limit of allowable single styrol concentration in atmospheric air was 0.003 mg/m^3. Rats exposed to continuous 70 days inhalation of air containing 50 and 0.05 mg/m^3 of styrol vapor showed disturbed muscle antagonists chronaxy ratios, a lowered coproporphyrin elimination with the urine, enhanced blood cholinesterase activity, increased numbers of leucocytes and monocytes and reduced number of erythrocytes, also some histopathologic changes of the internal organs. Inhalation of air containing 0.003 mg/m^3 of styrol under similar experimental conditions had no effect on any of the above mentioned indexes. Sanitary examination of the atmospheric air in the vicinity of a chemical plant producing polystyrol clearly indicated that styrol vapor air pollution extended over considerable distances from the plant and that only at 500 m from the source of pollution was the styrol concentration in the atmospheric air below the proposed limit of its allowable concentration.

F-5955

Odoshashvili, D. G.
HYGIENIC EVALUATION OF ATMOSPHERIC AIR POLLUTION WITH DIMETHYLFORMAMIDE. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 7.] V. A. Ryazanova (ed.). 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2):169-177, 1963.
CFSTI: TT 64-11574

A study was made of the effects of low dimethylformamide concentrations and the limit of its allowable concentration in the atmosphere. The concentration of threshold dimethylformamide odor perception was determined as 0.14 mg/m^3. The threshold concentration which produced electrocortical reflexes was 0.05 mg/m^3. Exposure of white rats continuously for 2 mon. (chronic intoxication) to inhalation of dimethylformamide vapor concentration of 10 and 0.5 mg/m^3 caused statistically reliable reduction in the cholinesterase activity and a drop in the rate of coproporphyrine elimination with the urine. Dimethylformamide vapor concentrations of 0.03 mg/m^3 were recommended as the limit of its allowable concentration in atmospheric air.

F-5956

Yakimchuk, P. P.
EXPERIMENTAL BASIS FOR THE LIMIT OF ALLOWABLE NITROGEN DIOXIDE CONCENTRATION IN ATMOSPHERIC AIR. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimya Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 7.] V. A. Ryazanova (ed.). 19 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2):177-184, 1963.
CFSTI: TT 64-11574

Experimental data for the determination of the limit of allowable nitrogen dioxide concentration in atmospheric air was studied. White rats were used as the experimental animals. They were exposed to chronic inhalation of air containing low concentrations of nitrogen dioxides, and the effect of such inhalation on the conditioned reflex activity of the rats was observed. Chronic exposure of white rats to the inhalation of 5.7 mg/m^3 of NO_2 for 6 months produced changes in their conditioned reflex activity, as shown by the appearance of phase states, differentiation disinhibition, and falling out of conditioned reflexes in response to weak stimulators. Chronic exposure of white rats to the inhalation of NO_2 in 0.34 mg/m^3 concentration caused less clearly expressed changes in the higher nervous activity, indicating that such a concentration of the gas must be regarded as active. The data presented were insufficient, and additional data must be secured before a limit of allowable NO_2 concentration in atmospheric air can be established with any degree of certainty.

F-5957

Mukhitov, B.
THE EFFECT OF LOW PHENOL CONCENTRATIONS ON THE ORGANISM OF MAN OR ANIMALS AND THEIR HYGIENIC EVALUATION. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vyp. 7.] V. A. Ryazanova (ed.). 24 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2):185-199, 1963.
CFSTI: TT 64-11574

The exposure of animal organisms to low phenol concentrations showed that the concentration of phenol threshold odor perception in most odor sensitive persons was 0.022 mg/m^3; the threshold concentration of reflex reaction of eye sensitivity to light was 0.0155 mg/m^3, and of electrocortical reflex formation 0.156 mg/m^3. Phenol concentrations of 0.125 and 0.0137 mg/m^3 had no reflex effect either on the eye sensitivity to light or on the electrocortical activity. Phenol vapor concentrations of 5 and 0.1 mg/m^3 were active during chronic experiments of continuous 61 days exposure; these concentrations elicited motor chronaxy changes, induced changes in the porphyrin metabolism, and affected cholinesterase activity; the 0.01 mg/m^3 concentration was not active according to the results of the chronic experiments. Results of chronic experiments indicated that 0.01 mg/m^3 of phenol vapor in the air should be adopted as the limit of its allowable concentration in atmospheric air.

F-6268

Shabad, L. M., L. N. Pylev, and T. S. Kolesnichenko
IMPORTANCE OF LOCAL RETENTION OF CARCINOGENIC AGENT IN PATHOGENESIS OF LUNG CANCER (EXPERIMENTAL INVESTIGATION). Vopr. Onkol. 10(6): 65-72, 1964. 30 refs. Translated from Russian. Federation Proc., Translation Supplement, 24(4):T717-T720, Aug. 1965.

Experiments were designed to study the elimination from the lung of 3,4-benzpyrene with repeated administration of suspensions of varied composition. Use was made of 230 random-bred rats of both sexes (133 males and 142 females), aged about 3 months and weighing 80-100 g. The amount of benzpyrene detectable in the lungs 24 hours after a single administration of the substance in physiological saline was somewhat less than after administration of benzpyrene with India ink and colloidal infusin. Three days after administration with India ink and colloidal infusin, the amount of benzpyrene retained in the lungs was nearly 12 times the amount remaining after administration in physiologic saline. After 5 days a difference was noted between the results of administration of benzpyrene with India ink and colloidal infusin and the administration of this substance with each of these ingredients separately. A distinct relationship is noted between repetition of administrations and the accumulation of benzpyrene in the lung. With repeated administrations, there is evidently further extension of inflammatory processes in the lung tissue, and the latter acquire a chronic character with corresponding exacerbations, which may be conducive to retention of the carcinogen in the lung tissue. Therefore, the decisive factor in the retention of benzpyrene in the lung tissue is the nature, combination and, probably, the quantity of the absorbent factors. The greatest deposition of benzpyrene was seen following its administration with India ink and colloidal infusin jointly, whereas its administration with either of these ingredients separately or with physiologic saline did not achieve this end.

F-6617

Sokolovskiy, V. V.
CONCERNING THE HEMOLYTIC ACTION OF THIOL POISONS. Tsitologiya, No. 4, p. 460-465, 1962. 22 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 10p., Nov. 23, 1962.
DDC: AD 400415

For a more complete illumination of questions concerning the ability of thiol poisons to cause destruction of erythrocytes, and for the relation of destructive changes in cells through inactivation of their SH-groups, the hemolytic action of specimens of all three types of thiol poisons, i.e., oxidizing (sodium nitrite), alkylating (monoiodoacetic acid), and mercaptide-forming (mercuric chloride) agents were studied. Thiol poisons of the mercaptide-forming, oxidizing and alkylating types produce hemolysis of erythrocytes in *in vitro* experiments. Hemolytic action by oxidizers can be prevented by thiol substances (2, 3 dimercaptopropane sodium sulfonate). An essential role in the preservation of the spatial structures of erythrocytes belongs to their sulfhydryl groups.

F-6660

Bushtueva, K. A., E. F. Polezhaev, and A. D. Semenenko
ELECTROENCEPHALOGRAPHIC DETERMINATION OF THRESHOLD REFLEX EFFECT OF ATMOSPHERIC POLLUTANTS. Gigiena i Sanit., 25(1):57-61, 1960. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 137-142, 1962.
CFSTI: TT 62-11103

The suitability of the electroencephalographic method for the determination of maximal single allowable concentration limits of air pollutants was studied. Electrical brain activity was recorded by means of a 4-lead amplifying device, 4UN4, and by an ink-recording apparatus ChR-1 in connection with an encephalograph trade-named "Al'var." Subjects were placed into an isolated screen-protected room. A small glass cylinder was firmly fixed in front of them, through which a continuous stream of air was passed at the rate of 30 l/min. Desynchronization of central electrical activity or depression in the a-rhythm were used as indexes of the effect induced by the test substances. Tests were made with SO_2 and H_2SO_4 aerosol. Results showed that 0.9 mg/m^3 of SO_2 elicited desynchronization in 4 of 6 persons tested. The specific effect of H_2SO_4 aerosol on the central nervous system indicated that concentrations which elicited a feeling of irritation changes in light sensitivity, and in optical chronaxy were at the 0.6 to 0.85 mg/m^3 level. Also reported are studies dealing with the development of conditioned "electrocortical" reflexes associated with the inhalation of the substances under study. It was found by this association modification that 0.6 mg/m^3 of SO_2 elicited reaction response in 4 of 5 persons tested. As a conditioned stimulator H_2SO_4 aerosol was used in 0.4 mg/m^3 concentration. The effect of the aerosol alone continued over 10 seconds and another 5 seconds in association with unbroken light.

F-6663

Rusinova, A. P.
BENZENE AND ITS HOMOLOGUES AS POISONS IN ELECTRICAL WINDING AND INSULATION PLANTS. Gigiena Truda i Prof. Zabolevaniya, 1(1):20-24, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 176-181, 1962.
CFSTI: TT 62-11103

The air of the winding and insulation department of the plant investigated contained benzene and its homologues in concentrations exceeding the allowable limits. Most unfavorable operations were: application of adhesives to micanite on tables manually and their loading into the drying ovens; insulation and lacquering of windings; brush coating of pole coils; and washing and cleaning various finished products. Unsatisfactory labor conditions produced occupational poisoning with aromatic hydrocarbons among the women workers, with symptoms of typical blood picture changes and nervous system disturbances. A state of susceptibility occurred to some common non-occupational diseases, as was shown by an increase in the morbidity of such diseases in women with toxic symptoms as compared with the control women.

F-6664

Yegorov, Yu. L.
HYGIENIC CHARACTERISTICS OF TANTALUM AND NIOBIUM (RARE METALS) DUSTS. Gigiena Truda i Prof. Zabolevaniya, 1(6):16-22, 1957. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 198-205, 1962.
CFSTI: TT 62-11103

An investigation was made of conditions prevailing in the manufacture and processing of tantalum and niobium with a view to proposing measures for the improvement of working conditions, to survey the state of workers health in this industry, and to determine experimentally the character and degree of toxic action of tantalum and niobium as a basis for arriving at hygienic standards in the manufacture of these metals. Results of observations made in manufacturing plants are detailed. In experiments with white rats tantalum was eliminated almost entirely from the gastro-intestinal tract within the first few days. Its resorption through the intestine had not been noted. The general toxic action of tantalum and niobium compounds was slight, probably due to extremely low solubility of tantalum compounds. The effects of dusts of niobium and tantalum compounds on pulmonary tissue following inhalation or intratracheal injection varied largely depending on the form of the dust. Niobium and tantalum and their compounds showed signs of possessing pronounced fibrogenic properties; this should be given serious consideration in establishing appropriate sanitary-hygienic standards for the Nb and Ta metallurgical industries.

F-6665

Katsnel'son, B. A.
PATHOGENIC PROPERTIES OF SOME DUSTS OCCURRING IN FERROUS METALLURGY PRODUCTION PLANTS. Gigiena Truda i Prof. Zabolevaniya, 1(2):24-30, 1957. 12 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 206-212, 1962.
CFSTI: TT 62-11103

White rats were given intratracheal injections of dusts associated with the metallurgical industry in an effort to evaluate the importance of the concentration of silicon dioxide in the development of pheumoconioses. Studies were conducted with 2 types of agglomerates (sinters): Bakal, containing 16.6 percent of SiO_2 of which 5.4 percent was of the free type and Magnitogorsk, which contained 8.8 percent of total and 9.7 percent free SiO_2. Experiments were also conducted with coke of Kuznetsk coal produced by the Chelyavinsk coke department of the metallurgical plant. The coke contained 10.9 percent of ash, i.e., approximately 5 percent of total SiO_2 and no free SiO_2. Animals were sacrificed 15, 30, 91, 183, 274, 365, and 548 days after injection of the dust suspension. Coal dust (coke) and agglomerate (sinter) dust in the presence of SiO_2 concentrations not exceeding 1 percent, or in its complete absence, were found to elicit pulmonary changes in the form of poorly expressed fibricotic processes; it is hypothecated that blocking of pulmonary lymphatic passages by the dust may have a noteworthy auxilary effect on the development of this type of pathology. It was demonstrated that the almost negligible concentration of SiO_2 in agglomerate (sinter) dust can affect the normal lung tissue reaction imparting to it the characteristics of pneumoconiosis and siderosilicosis.

F-6666

Kalyuzhnyi, D. N.
EFFECT OF METALLURGICAL-PLANT EMISSIONS ON CHILDREN'S HEALTH. Gigiena i Sanit., 24(2):3-7, 1959. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 220-224, 1962.
CFSTI: TT 62-11103

An investigation was made of the effects of emissions from metallurgical industries upon the health of children residing in two cities affected by pollution from these industries. For control purposes, children living in two other cities with no metallurgical industries were studied simultaneously. Dust and SO_2 measurements were made in all four cities. The children were given chest x-rays and data was compiled on the frequency of occurrence of infectious diseases. Comparative analyses of the x-rays indicated that those children residing in areas of industrial pollution showed signs of pulmonary pathology of a more profound type, and in greater numbers, than the children in the control groups. No correlation was found between the rate of pathologic pulmonary findings and past infectious disease. Recommendations are made for the purpose of reducing the amount of pollutants emitted into the atmosphere.

F-6667

Babayants, R. A.
EFFECT OF CITY AIR POLLUTION ON THE POPULATION'S HEALTH. Vestn. Akad. Med. Nauk SSSR, 14(12):3-12, 1959. 15 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 224-236, 1962.
CFSTI: TT 62-11103

Previous investigations into the health effects of air pollution are reviewed. Pertinent data and major conclusions from each of these studies are presented. Subjects of the investigations under review include: Comparison of the morbidity of populations in polluted and non-polluted areas; chest x-ray and morbidity studies of children; correlation studies of the occurrence of upper respiratory illness and distance of residence from given emission sources; carbon monoxide concentrations in connection with traffic densities and carboxyhemoglobin levels; indoor concentrations of carbon monoxide correlated with frequency of complaints of physical discomfort; and lung cancer morbidity and mortality.

F-6668

Khachatryan, M. K.
VITAMIN C IN THE ORGANISM IN CONNECTION WITH ATMOSPHERIC POLLUTION BY DISCHARGES FROM SYNTHETIC CHLOROPRENE RUBBER MANUFACTURE. Gigiena i Sanit., 24(12):3-6, 1959. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 240-244, 1962.
CFSTI: TT 62-11103

An investigation was made of the population residing in the vicinity of a plant manufacturing chloroprene rubber to determine the degree of possible vitamin C deficiency, and use it as an index of the unfavorable effects of the plant's discharges on the health of residents and animals. Domestic cats were taken from dwellings located within 2 km from the plant and the liver, spleen, kidneys, and heart were tested for ascorbic acid content. A similar study was made with animals of a control group obtained from a region outside the zone of industrial discharge effects. A comparison of averages showed that the absorbic acid content of all organs under study was considerably lower in animals exposed 1 to 6 years to the air polluted by the chloroprene synthetic rubber discharges. Children of a kindergarten located at 500 m from the plant who lived within a 2 km radius around the plant were examined medically. The control group consisted of children of another kindergarten, located outside the effects of the industrial discharges. Vitamin C was determined by excretion via the urine after saturation with vitamin C. Under observation were 151 children, 48 belonging to the control group. Ascorbic acid content of the urine was determined on 3 successive days before administering the saturation dose and for 6 days following. Determination was made by titration with dichlorophenolindophenol. Results indicated that children who lived within a radius of 2 km from the plant and attended the kindergarten located at 500 m from the source of pollution manifested a definite vitamin C deficiency.

F-6669

Minkh, A. A.
IONIC STATE OF AIR IN LIVING QUARTERS AND ITS HYGIENIC SIGNIFICANCE. Gigiena i Sanit., 25(1):78-83, 1960. 22 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational diseases, No. 7, p. 249-255, 1962.
CFSTI: TT 62-11103

An attempt was made to evaluate the physiological significance of the changes produced by air ionization of living quarters and of the public buildings. Factors affecting the state of indoor air ionization are discussed. Arguments are presented for and against the theory that fluctuations in the ionic state of indoor air affect the human body. The question of the advisability of artificial air ionization is considered, and it is concluded that the problem requires further study.

F-6670

Tiunov, L. A., T. I. Sokolova, and V. P. Paribok
DURATION OF CARBON MONOXIDE EXCRETION FROM THE BODY. Farmakol. i Toksikol., 20(4):76-78, 1957. Translated from Russian by B. S. Levine, U.S.S.R.

Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 262-264, 1962.
CFSTI: TT 62-11103

The rate of CO elimination from the blood and its possible retention in tissues were investigated. Cats were exposed to radioactive CO through inhalation and intravenous injection. Blood activity was measured at one hour intervals following exposure. After the CO was completely eliminated from the blood, the animals were sacrificed and brain, heart, liver, and muscle tissue were examined. Although the elimination rate varied with each animal, the point at which 90 percent of the CO had been eliminated never exceeded 7 hours, even in animals exposed for 49 hours. CO retention in the tissues was found to be of an extremely small magnitude.

F-6675

Lindberg, Z. Ya.
EFFECT OF SUPERPHOSPHATE PRODUCTION DISCHARGES ON CHILDREN'S HEALTH. Gigiena i Sanit., 25(5):89-96, 1960. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 284-288, 1962.
CFSTI: TT 62-11103

In order to assess the possible health effects of emissions from a superphosphate plant, the frequency of upper respiratory illness was studied in 2053 children. Of this total, 1375 children liven in the vicinity of the plant and 678 were controls. Air samples were taken in the inhabited zones around the plant at distances of 500 and 3000 meters. The concentrations in excess of allowable limits are given for SO_2, H_2SO_4, F, and NO_x. Most of the children involved in the study were given either x-ray or fluoroscopic chest examinations. The results of these examinations were correlated with tuberculin skin tests. The data indicated that children residing in the area of the superphosphate plant had a higher frequency of both upper respiratory ailments and tuberculosis.

F-6676

Vasil'eva, A. A. and M. D. Manita
CARBOXYHEMOGLOBIN IN THE BLOOD OF PERSONS DIRECTING CITY TRAFFIC. Gigiena i Sanit., 25(12):77-80, 1960. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 290-293, 1962.
CFSTI: TT 62-11103

The blood of individuals engaged in directing city traffic was analyzed for carboxyhemoglobin (COHb) concentration. Results are tabulated for summer and fall, both before and after tour of duty, and correlated with smoking habits. A higher level of COHb was found in the traffic directors than in appropriately selected controls.

F-6866

Arkhipova, O. G., M. S. Tolgskaya and T. A. Kochetkova
TOXICITY WITHIN A FACTORY OF THE VAPOR OF NEW ANTIKNOCK COMPOUND, MANGANESE CYCLOPENTADIENYLTRICARBONYL. [K voprosu o toksichnosti parov novogo antidetonatora tsiklopendadieniltrikarbonila margantsa (v vozukhe priozvodstvennykh pomeshchenii).] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(4):40-44, April 1965.

Manganese cyclopentadienyltricarbonyl (MTC) is toxigenic in small concentrations and has pronounced cumulative properties. A single exposure to MCT vapors in 0.1 mg/l concentrations in the air is dangerous for life. In concentrations of 0.01 mg/l in the air this substance may cause serious and lethal poisoning in cases of multiple exposures. Concentrations at a level of 0.001 mg/l produce functional shifts in the nervous system and initial morphological lesions in the respiratory tract. The new antidetonator is endowed with a weak irrigating effect at the site of contact; when dissolved in oil and benzene it does not penetrate the skin. The solvent tetrahydrofuran, which is used in the production of MCT in tetrahydrofuran penetrates intact skin and causes intoxication.

F-6870

Kulakov, A. E.
THE EFFECT OF PROLONGED INHALATION OF LOW CONCENTRATION OF HEXAMETHYLENEDIAMINE ON EXPERIMENTAL ANIMALS. [Deistvie geksametilendiamina v malykh kontsentratsiyakh na organizm podopytnykh zhivotnykh v usloviyakh khronicheskoi ingalyatsionnoi zatravki.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(5):160-166, May 1965. 8 refs.

For a period of 3 months, 24-hr inhalation poisoning of 60 albino rats with low concentration of hexamethylenediamine (HMD) was carried out. HMD at a concentration of 1 mg/m^3 produces in animals a retardation of their weight, an increase of the number of reticulocytes at the beginning of poisoning, a fall in the number of eosinophiles, a rise in the number of leucocytes with a changed fluorescence in the first half of the poisoning period, an inhibition of the phagocytic activity of leucocytes, a rise in the Vi-antibody titer and a disturbance of the chronaxie correlation of the muscle antagonists. HMD at a concentration of 0.040 mg/m^3 caused similar changes but to a lesser extent. HMD at a concentration of 0.001 mg/m^3 proved to be ineffective. On the basis of the investigations performed the daily average maximum permissible concentration of HMD in the atmospheric air at a level of the single maximum concentration amounting to 0.001 mg/m^3 is suggested. (Author's summary, modified)

F-6871

Kogan, F. M., A. A. Gerasimenko and G. I. Bunimovich
THE OCCURRENCE OF CERTAIN IMMUNOBIOLOGICAL CHANGES IN ASBESTOSIS. [Nekotorye immunobiologicheskie sdvigi pri asbestoze.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(5):184-191, May 1965. 19 refs.

Immunobiological reactivity was studied in asbestosis patients and healthy persons who had worked with asbestos over a fairly long period of time to find out whether changes in reactivity were due to a developing condition of asbestosis or whether it preceded asbestosis. Long-term inhalation of asbestos dust brought about a fall of the immunobiological reactivity of the body and probably, its allergization. There was a most distinct inhibition of the complement titer. The changes of the complement titer preceded the onset of clinical and X-ray symptoms of pneumoconiosis. The study of the immunobiological reactivity of persons sick with asbestosis, caused by the inhalation of chrysotile asbestos and anthophyllite asbestos, showed that in the first case the reactivity was inhibited to a greater extent. This was noted in the clinical course of asbestosis as well. Persons sick with asbestosis and those working under conditions of high dust content of the air presented lesions peculiar to autoimmunologic disease: rise in the gamma-globulin and anticomplementary activity of the serum.

F-6874

Kashin, L. M.
OVERALL IMMUNOLOGICAL REACTIVITY AND MORBIDITY OF WORKERS EXPOSED TO CARBON DISULFIDE. [Sostoyanie obschchei immunologicheskoi reaktivnosti organizma i zabolevaemost' rabochikh pri vozdeistvii serougleroda.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(6):331-335, June 1965. 5 refs.

An attempt was made to elicit the effect of carbon sulfide in small concentrations on the immunological reactivity of the body and the morbidity with temporary disability of workers at a rayon production plant. A drop in the general immunological reactivity and a rise in the morbidity rate were observed in workers exposed to the action of carbon sulfide at concentrations both above and below the maximum permissible level. A relationship was demonstrated between the state of the general immunological reactivity and that of the morbidity with temporary disability: the morbidity rate dropped with a rise of the body's reactivity. (Author's summary)

F-6875

Sinitsyna, E. L.
INVESTIGATIONS INTO CERTAIN ASPECTS OF THE HEALTH OF PEOPLE WORKING IN THE MAIN SHOPS OF TANNERIES. [Fiziologo-gigienicheskie mablyudeniya nad rabotayuschimi v osnovnykh kozhevennykh zavodov.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(6):336-340, June 1965. 8 refs.

Observations made of the labor conditions prevailing at tanneries showed that, in spite of the mechanization of production processes, the proportion of heavy manual tasks performed was still high. A study of the 24-hour rhythm of certain physiological functions revealed stable signs of fatigue in workers of the ash and tanning shops. The air of these shops was contaminated with ammonium vapors; however, it was practically free of hydrogen sulfide. An examination of the labor conditions is suggested. (Author's summary)

F-6878

Galikeev, Kh. L.
STUDIES OF ALLERGENIC PROPERTIES OF FUNGI IN INDOOR DUST. [Izuchenie allergennykh sviostv gribkov pyli pomeshchehenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(6):416-418, June 1965. 6 refs.

The specific composition of fungus flora in room dust was studied and its allergenic properties determined. The allergenic properties of different fungi species found in dust were tested on rabbits. Dust in living quarters, schoolrooms and cinemas contains spores of the fungi Cladosporium, Penicillium, Aspergillus, Mucorales, Candida, Alternaria. Room dust sensitizes experimental animals which then yield positive skin reactions with allergens obtained from saprophytic fungi.

F-6879

Dubeikovskaya, L. S., A. A. Dolmatov and T. V. Orlova
EFFECT ON THE LUNGS OF MIXED DUST IN THE MANUFACTURE OF CERAMIC CAPACITORS. [O deistvii na legkie smeshannoi pyli na proiz vodstve keramicheskikh kondensatorov.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(6):421-423, June 1965.

The effects of dust of mixed composition liberated into the air during the manufacture of ceramic capacitors on workers was investigated. Two investigations were carried out, with an interval of about three years. The medical examination of 133 people who worked in contact with the dust revealed changes in the upper respiratory tract in 33 percent.

F-6880

Blinova, E. A.
INDUSTRIAL STANDARDS FOR SUBSTANCES EMITTING STRONG ODORS. [O normirovanii kontsentratsii veshchestv s sil'nym zapakhom v vozdukhe proizvodstevennykh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1):18-23, Jan. 1965. 8 refs.

Research was carried out on the olfactory threshold of ethyl-, propyl-, butyl- and dodecylmercaptans. Various concentrations were produced in a 100-l chamber. The experiments were performed on volunteers who inhaled ethylmercaptan vapor for 1 min from a gas mask which was connected to the chamber (the exhaled air was returned to the chamber). 1. The olfactory thresholds of ethyl-, propyl-, and butylmercaptans are of the same order of magnitude ($0.4x10^{-4}$-$0.6x10^{-5}$ mg/l): in the case of dodecylmercaptan the threshold is considerably higher (0.0x 10^{-2}-$0.4x10^{-2}$ mg/l). 2. Ethylmercaptan in a concentration of 0.01 mg/l inhaled for 3 hr daily in the course of 6 to 10 days had an unfavorable effect on the volunteers, causing headaches, fatigue, vertigo, transient nausea, and irritation of the upper respiratory tract. Objectively, this concentration caused a considerable rise in the olfactory threshold (for ethylmercaptan), a decrease in rheobase, and fatigue (revealed by the correction method). 3. Ethylmercaptan vapors in a concentration of 0.001 mg/l inhaled for 3 hr daily in the course of 5 days did not have any distinct effect on the human organism. Subjective sensations included only that of a moderate smell which subsided or disappeared altogether. The rise in olfactory threshold was less than in the preceding experimental series. 4. In view of the above facts, and also taking into consideration the fact that an 0.1 mg/l concentration of ethylmercaptan vapor used in a chronic experiment caused only functional changes in animals, the author tentatively recommends the dose of 0.001 mg/l as the maximum permissible concentration of ethylmercaptan vapor for factories. (Author's summary, modified)

F-6882

Rorokin, V. P., V. M. Moroz, E. F. Meier and M. P. Koktova.
POLLUTION OF THE ATMOSPHERE WITH SULFUR DIOXIDE PRODUCED BY AN UNDERGROUND FIRE IN A MINE. [Sluchai zagryazneniya atmosfernogo vozdukha sernistym gazom iz gornykh vyrabotok pri podzemon pozhare.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1):73-74, Jan. 1965. 1 ref.
CFSTI: TT 66-51033

The case described occurred at a polymetallic ore mine as a result of the spontaneous ignition of part of the ore lost in working the mine by the method of block-caving. The polluted mine air was ejected to a height of 2 m above the ground surface, and then flowed downwards along the gorge to the settlement located at a distance of 70 m. This resulted in complaints, previously nonexistent, of the inhabitants about irritation of the upper respiratory tract, headaches, and disturbed sleep. Such conditions were most often encountered at night, in calm weather. SO_2 analyses were performed nephelometrically. Several samples were also taken at the pit head, where the SO_2 concentration was 1203.0 to 8775.3 mg/m. The high SO_2 concentration in the atmosphere prevented the population from opening their windows. As a result of this investigation, certain measures to improve the situation were planned and put into effect. These measures included discharging the mine gas, through a pipe along the southern slope of the mountain, to a level of 300 m and into stronger air currents; temporary evacuation of those areas of the settlement which were in the range of high SO_2 concentrations; prompter silting of underground fires or where walls were caving in; and more efficient ventilation of the mine.

F-6887

Burkatskaya, E. N.
MAXIMUM PERMISSIBLE CONCENTRATION OF DINITRO-O-CRESOL IN AIR. [Obosnovanie predel'no dupustimoi kontsentratsii dinitro-ortokrezola v vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(2):197-201, Feb. 1965. 2 refs.
CFSTI: TT 66-51033

In view of the highly toxic properties of dinitro-o-cresol and the possibility of its penetration into workers through the respiratory tract, it was decided to test its toxicity on inhalation. The compounds with a base of dinitro-ortho-cresol, that are widely used in agriculture, are highly toxic when introduced into the body by means of inhalation. The toxic concentration of these compounds amounts to 0.036 mg/l and the lethal one -- 0.1 mg/l. Repeated poisoning of animals in a concentration of 0.0002 mg/l for a period of 2-3 months produced an insignificant toxic effect. The maximum permissible concentration of this compound in the air was determined; it amounted to 0.00005 mg/l. (Author's summary, modified)

F-6891

Kirichenko, V. N.
DISTRIBUTION OF INHALED SHORT-LIVED DAUGHTER PRODUCTS OF RADON IN THE RESPIRATORY TRACT. [O raspredelenii v organakh dykhaniya poloshchennoi dozy ot korotkozhivuschchikh dochernikh produktov radona.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(2):301-304, Feb. 1965. 4 refs.
CFSTI: 66-51033

An attempt was made to calculate the distribution of the absorbed dose from the daughter products of radon in various portions of the respiratory tract as a function of the size of the carrier particles on the basis of the theory and experimental data. A highly simplified model of the human respiratory tract, according to Findeisen, was used where the respiratory tract is represented as successively branching cylindrical tubes; the last tubes end in hollow spheres; the rate of respiration is assumed constant and equal to 12 liters/min. The calculation was performed for particles less than 10^{-5} cm; hence it was assumed that they settle only on account of diffusion. It is pointed out that the results cited in this work are approximate. However, the errors cannot significantly change the pronounced nonuniformity of the distribution of the absorbed dose, and this undoubtedly must be taken into consideration in the evaluation of the biological toxicity of air containing radon.

F-6892

Tarkhova, L. P.
MATERIALS FOR DETERMINING THE MAXIMUM PERMISSIBLE CONCENTRATION OF CHLOROBENZOL IN ATMOSPHERIC AIR. [Materialy k obosnovaniyu predel'no dopustimoi kontsentratsii khlorbenzola v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(3):327-333, Mar. 1965. 7 refs.
CFSTI: TT 66-51033

According to the data in the literature, the toxicity of chlorobenzol is noted only in high concentrations. But there are no data on the content of this substance in atmospheric air, or on the action of small concentrations on man. The maximum permissible concentration of chlorobenzol in the atmospheric air of populated places has not been ascertained. The author undertook the present investigation in order to fill this gap. The threshold of olfactory preception of chlorobenzol is 0.4 mg/m^3 for the most sensitive persons. The threshold of the action of this substance on the electric activity of the brain is 0.2 mg/m^3; the ineffective concentration is 0.1 mg/m^3. The maximum single-time permissible concentration of chlorobenzol lies at the level of 0.1 mg/m^3. Chlorobenzol in 1 mg/m^3 concentration in the chronic treatment of white rats causes a lowering and distortion of the correct ratio of the chronaxia of the antagonist muscles, raises the cholinesterase activity and lowers the alpha-globulin content in the blood serum. Chlorobenzol in 0.1 mg/m^3 concentration in chronic action on white rats does not cause the changes observed at a high concentration of that substance (1 mg/m^3). The average 24-hour maximum permissible chlorobenzol concentration may be at the level of the maximum single-time concentration (0.1 mg/m^3). (Author's summary, modified)

F-6895

Yuldashev, T.
MAXIMUM PERMISSIBLE CONCENTRATION OF ETHYLENE OXIDE IN THE ATMOSPHERE. [Eksperimental'nye dannye k gigienicheskomu obosnovaniyu predel'no dopustimoi kontsentratsii okisi etilena v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(10):1-6, Oct. 1965. 7 refs.

The maximum permissible one-time and mean-diurnal concentrations of ethylene oxide were determined. Twenty human subjects are used to determine the olfactory threshold. The olfactory threshold for ethylene oxide is 1.5 mg/m^3 in the most highly sensitive individuals, the threshold for a change in the sensitivity of the eye to light is 1 mg/m^3, and the electrical activity of the cerebral cortex is affected at the level of 0.65 mg/m^3. The maximum one-time permissible concentration of the substance in the atmosphere is 0.3 mg/m^3. Prolonged round-the-clock poisoning of albino rats with ethylene oxide concentration of 0.3 mg/m^3 for 83 days causes changes in the ratio of flexors and extensors as well as in the concentrations of chlorides and residual nitrogen in blood. The mean-diurnal maximum permissible concentration of ethylene oxide in the atmosphere is established at the level of 0.03 mg/m^3.

F-6896

Davydov, S. A.
CERTAIN PHYSIOLOGICAL CHANGES IN CHILDREN EXPOSED TO ATMOSPHERE WHICH HAS BEEN POLLUTED BY CEMENT WORKS. [O nekotorykh fiziologicheskikh sdvigakh u detei v usloviyakh zagryaznenmogo tsementnymi zavodami atmosfernogo vozdukha.] Hygiene and Sanitation

(English translation of: Gigiena i Sanit.), 30(10):7-12, Oct. 1965. 5 refs.

The effects of cement dust on children were investigated. Physiological reactions in children age 10 to 12 who lived at distances 0.5 and 2km from cement work sites for at least five years and also children living at control points are examined. The mean dust concentrations in the air are 1.48 mg/m^3 at a distance of 0.5km from the work site, 0.49 mg/m^3 at a distance of 2km and 0.3 mg/m^3 at the control point. Practically healthy children residing in a dusty atmosphere for a prolonged period exhibited a reduced excitability of the olfactory analyzer and of the vegetative nervous system. They also exhibited an enhanced migration of leukocytes to the surface of the nasal and conjunctival mucosae and increased desquamation of epithelial cells. The changes in the physiological parameters were obviously due to the effect of the cement dust on the exteroceptors.

F-6897

Podosinovskii, V. V.
TOXICITY OF INDUSTRIALLY USED INDIUM COMPOUNDS. [O toksichmosti soedinenii indiya, imeyushchikh promyshlennoe znachenie.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(10):32-39, Oct. 1965. 9 refs.

A sanitary hygienic investigation of the production of metal indium revealed an actual possibility of the workers' affection by the indium oxide dust, the industrial dust of mixed nature (indium oxide, cadmium, silicon, lead, zinc), indium salt solutions, and other noxious factors. In experiments performed on animals (albino mice, guinea pigs and rabbits) the more toxic effect was produced by soluble indium nitrate that affected the parenchymatous organs and caused a series of functional and biochemical disturbances. An intratracheal introduction to albino rats of 50 mg of industrial dust caused death in 100 percent of cases, and that of indium oxide produced a weak toxic effect on the body and the development of inflammatory and sclerotic lesions in the lungs. It was only the soluble indium compounds (nitrates, chlorides) that irritated the rabbits' skin and eyes. (Author's abstract)

F-6905

Gusev, I. S.
REFLECTIVE EFFECTS OF MICROCONCENTRATIONS OF BENZENE, TOLUENE, XYLENE AND THEIR COMPARATIVE ASSESSMENT. [Reflektornoe deistvie mikrokontsentratsii benzola, toluola, i ksilola i ego sravnitel'naya otsenka.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(12):331-336, Dec. 1965. 6 refs.

The reflective effect on the electrical activity of the cerebral cortex of imperceptible concentrations of benzene, toluene, and xylene was investigated on highly sensitive individuals. The threshold concentrations of aromatic hydrocarbons decrease from benzene to xylene with respect to their effect on cerebral electric activity. The electric potentials are increased by benzene and toluene, while xylene has the opposite effect, causing a marked inhibition of the electric activity of the cerebral cortex. Concentrations of 1.5 mg/m^3 benzene, 0.6 mg/m^3 toluene, and 0.2 mg/m^3 xylene are subliminal with respect to their effect on the electric activity of the cerebral cortex and imperceptible with respect to odor. These concentrations are recommended as the maximum permissible one-time atmospheric concentrations.

F-6907

Kopanev, A. I.
VITAL STAINING OF TISSUES IN ESTABLISHING STANDARDS OF ATMOSPHERIC POLLUTANTS. [Ob ispol'zovanii metoda vital'nogo okrashivaniya tkanei pri normirovanii atmosfernykh zagriaznenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(12):390-393, Dec. 1965. 4 refs.

The method of vital staining was used in order to study the functional state of the tissues of animals which had been exposed for a prolonged period to relatively low concentrations of ethyleneglycol vapor, and also to determine the effective threshold for this substance. Three groups of albino rats were continuously exposed to ethyleneglycol vapor concentrations of 75, 15, and 3 mg/m^3 for 60 days, while the fourth group serves as the control. The accumulation index, the elimination index and the trophic potential are determined. The organs investigated are the liver, kidney, brain, lungs and spleen. In the first group (75 mg/m^3) a high accumulation index was found in the tissues of liver, kidneys, and brain; in the second group (15 mg/m^3) the increase in the absorption of the vital dye was less pronounced and was observed only in the liver tissues. Changes directed at compensating the disturbed functions are investigated by studies of the elimination index of vital dye. In the first group (75 mg/m^3) the elimination index is high in the lung and kidney and low in the liver; in the second group the elimination index is low in the liver and kidney. The group of animals exposed to the smallest investigated concentration of 3 mg/m^3 did not exhibit any difference from the control group with respect to the indices of the accumulation and the elimination of the vital dye. Animals exposed to ethyleneglycol concentration of 75 mg/m^3 exhibited a decrease in the trophic potential in lungs. The liver, brain and spleen exhibited a significant increase in the trophic potentials pointing to increased activity of the appropriate cells. Animals treated with ethyleneglycol vapor concentration of 15 mg/m^3 exhibit an increase of trophic potential in the liver, kidneys and spleen. Ethyleneglycol concentration of 3 mg/m^3 causes no changes of the trophic potential in any organs of the animals, neither does it cause changes in any other indices of vital staining in comparison with the control group. This concentration of the substance also proved to be subliminal in its effect on the chronaxie of antagonistic muscles, acetylcholinesterase activity of blood and certain other tests. Vital staining of tissues is a sensitive method and deserves to be used when assessing hygienic standards for atmospheric pollutants.

F-7117

Mezentseva, N. V., O. Ya. Mogilevskaya and T. A. Roshchina
DATA ON THE EFFECT OF OXIDES OF THE RARE-EARTH METALS ON THE ORGANISM. [Materialy o deistvii na organizm okislov redkozemel'nykh metallov.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(5): 126-132, May 1964. 7 refs.
CFSTI: TT 65-50023/5

The toxicity of oxides of rare earth metals was studied. The animals used were mice, guinea pigs, and white rats. It was determined that oxides of the rare-earth metals (Dy, Gd, Y, Eu, Sm, Nd, and Ce) possess weakly expressed general-toxic action in acute and subacute experiments. Dust of the indicated oxides in prolonged action evokes pronounced changes in the lungs of the experimental animals. The degree and character of the changes are different in the action of dust of different oxides. Besides, certain of them are characterized by moderate fibrogenic action. The data of the experiments testify to the necessity of carrying out prophylactic measures during work connected with possible liberation of dust of oxides of the rare-earth metals.

F-7129

Bogdat'eva, A. G. and D. Ya. Vud
THE EFFECT OF CRUDE-OIL CRACKING PRODUCTS ON THE ANIMAL ORGANISM. Gigiena i Sanit., 22(5):37-40, 1947. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 41-45, Jan. 1960
CFSTI: TT 60-21049

Cracking-gasoline, cracking-kerosene and cracking-residue were rubbed into the skin of rabbit's ears, which resulted in certain changes in the histologic picture of the skin and some organs. Changes at the point of application were limited to moderate hyperplastic and inflammatory manifestations; the general effect was acute emaciation and death of most of the test rabbits. Cracking products which had a higher initial boiling point manifested more profound toxic effects as evidenced by the histologic pictures and by the shorter survival period. The liver and ovaries showed the gravest pathological (degenerative) change. In the course of the histologic studies no carcinogenic tendencies were displayed by the cracking products tested. The results clearly showed that the skin of workers in the crude oil industry (cracking) must be protected to prevent the development of such consequences as were indicated by this study. (Authors' summary)

F-7130

Korenevskaya, E. J.
THE EFFECT OF HIGH AIR TEMPERATURE ON THE TOXICITY OF CARBON MONOXIDE. Gigiena i Sanit., (9):19, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 46-52, Jan. 1960.
CFSTI: TT 60-21049

Results of the experimental study of carbon monoxide effect at high air temperature showed that air temperature below 35° caused no disturbances in rabbit's thermoregulation mechanism; the increase in CO toxic effects at such temperature was insignificant and probably depended on the accelerated accumulation of carboxyhemoglobin in the blood, mainly due to increased lung ventilation. High air temperature ($40\text{-}45^{\circ}$) disturbed the process of thermoregulation in the body. Under such conditions intoxication with carbon monoxide followed a graver course than in normal temperature conditions; carboxyhemoglobin concentration in the blood cannot serve as the criterion of intoxication gravity since the rise in the carboxyhemoglobin level lagged considerably behind the developing clinical symptoms of poisoning. In addition to intensification of the effect of carbon monoxide in combined hyperthermy and CO intoxication, the body's resistance to temperature was also reduced. Thus, the toxic effects of CO in hyperthermy were synergistic, a fact which is expressed in intensified clinical symptomological pictures. (Author's summary)

F-7131

Iorshin, A. L.
STREET AIR POLLUTION EYE TRAUMAS. Gigiena i Sanit., (10):40-43, 1955. Translated from Russian by B.S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 53-54, Jan. 1960.
CFSTI: TT 60-21049

Eye trauma occurrence caused by particulate matter floating in street air was investigated. The study was based on case histories of three polyclinics located at different distances from a large hydroelectric station. A detailed study of 18,510 histories of ambulatory cases belonging to the emergency division of the Institute of Eye Diseases showed that the number of cases treated for street-caused eye traumas during six months in 1950 constituted 60 percent of all the emergency calls. In 58 percent of the cases the eye traumas were accompanied by corneal traumas, 3 percent of which showed signs of erosion, hyperemia, and infiltration. Another study was made of 10,521 cases of street air pollution eye traumas for the months of January to June inclusive, belonging to 23 different polyclinics located in different sections. The greater number of cases of street-occurred eye traumas belonged to the polyclinics located in the immediate vicinity of railway stations and of a large electric power plant, neither of which had provision for ash abatement or ash trapping. A table demonstrates the effectiveness of dust trapping installations as a preventative measure against street-air caused eye traumas in the vicinity of the electric power station which, prior to the installation of the dust trapping devices, was the primary source of air pollution of the section under study.

F-7132

Zykova, A. S.
POLLUTION OF ATMOSPHERIC AIR WITH LEAD AND ITS EFFECT ON THE HEALTH OF THE POPULATION. Gigiena i Sanit., 22(2):12-17, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 52-62, Jan. 1960.
CFSTI: TT 60-21049

The pollution with lead-containing discharges by accumulator and lead smelting plants was found to be of permanent character. Lead was found in 73 - 97 percent of the air samples tested. The total quantity of lead liberated into the air by the discharges of the accumulator plant under normal conditions of production amounted to 5.7 kg/day and by the discharges of the lead smelting plant to 14.7 kg/day. The average daily concentration of lead at a distance of 500 - 700 meters from the storage battery plant was 3 - 4 times as great as the 0.0007 mg/m^3 upper limit adopted as the allowable concentration. At a distance of 1500 meters from the lead smelting plant the average daily concentration of lead was 5 - 6 times as great as the limit of allowable concentration. The lead penetrated into the living quarters and community dwellings where its concentration in the indoor air was 3 - 5 times as great as the limit of allowable concentration. Analysis of the dust settled inside living dwellings showed that lead accumulated within living premises, creating an indoor source of lead pollution. Polyclinic examination of a group of old inhabitants of the region showed that the frequency of occurrence of functional neurological and gastro-enteric disturbances among them was many times greater than among a control coming from a region free from such pollution; the same was true of the frequency of occurrence of functional cardio-vascular disturbances. The quantity of lead found in the urine of persons living in the industrially air-polluted region indicated that many inhabitants carried within them high concentration lead deposits. Results of a histochemical study pointed to the existence of a lead accumulating process among the residents of the industrially air-polluted region, which progressively increased with the continued residence in such lead polluted regions.

F-7133

Bushtueva, K. A.
THE TOXICITY OF H_2SO_4 AEROSOL. Gigiena i Sanit., 22(2):17-22, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 63-66B, Jan. 1960.
CFSTI: TT 60-21049

The effects of low concentrations of H_2SO_4 aerosols obtained by a chemical condensation method were studied. Three series of uninterrupted experimental exposures to 8, 4 and 2 mg/m^3 H_2SO_4 of aerosol over five day periods were performed using guinea pigs 1.5 to 2 months old. Findings in the lungs showed disturbances of the blood and lymph circulations with the development of focal edemas and acute interstitial processes with the consequent development of chronic processes. This process was observed after 5 days exposure of animals to 2 mg/m^3 of the aerosol, or the equivalent of the limit of allowable concentrations of H_2SO_4 aerosol in work-rooms and shops. This finding indicates that there is need for the restudy of the limit of allowable H_2SO_4 aerosol concentration presently in effect for manufacturing and production premises. The present limit of such allowable concentration should be lowered.

F-7134

Gol'dberg, M. S.
THE EFFECT OF ELECTRIC HEAT AND POWER PLANT DISCHARGES ON THE HEALTH OF CHILDREN. Gigiena i Sanit., No. 4, p. 9-15, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 67-74, Jan. 1960.
CFSTI: TT 60-21049

Two parallel studies were made, at an interval of 3.5 years, of the effect of discharges into the atmospheric air by powerful electrostations on the pulmonary condition of children. Persistent fibrotic pulmonary changes found among the children were regarded as the results of high concentrations of quartz in the industrial air-polluting dust. The results pointed to the immediate imperative need for the development of measures to control emissions from electric heat and power plants.

F-7136

Beryushev, K. G., M. V. Rumantsev and I. L. Koragodina
THE EFFECT OF NOISE AND EXHAUST GASES OF CITY TRAFFIC ON THE HYGIENIC CONDITIONS OF HOSPITALS AND HOSPITAL GROUNDS. Gigiena i Sanit., No. 5, p. 9-16, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 79-88, Jan. 1960.
CFSTI: TT 60-21049

Studies were made of Moscow city hospitals located (a) on the main thoroughfare, where passenger and freight automobile traffic was normally heavy; and (b) on streets the predominant traffic of which consisted of trolleys and automobile traffic. Noise intensity measurements were made and air samples were taken during the summer-fall and spring seasons of 1954 - 1955 at the following collection points: (a) between the sidewalk and the driveway part of the street in front of hospital grounds; (b) on hospital grounds in front of wards at distances of 15, 30, 45, 60 and 82 meters from the street; (c) inside hospital buildings, 20, 25, 30, 36 and 82 meters away from the streets, with windows closed, as well as open. It was found that noise created by city traffic exceeded the limits of allowable noise intensities which affected the patients' subjective sense of well being. Exhaust gases of autobuses polluted the atmospheric air of hospital grounds and wards. The carbon monoxide content of most air samples collected inside hospital buildings at different distances from the driveway part of the street considerably exceeded the limits of its allowable concentration.

F-7137

Bystrova, T. A.
EFFECTS OF SULFUR DIOXIDE STUDIES WITH THE AID OF LABELED ATOMS. Gigiena i Sanit., 22(5):30-37, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 89-97, Jan. 1960.
CFSTI: TT 60-21049

The distribution of SO_2 in the body, its effects on the blood circulation and methods and avenues of its elimination were investigated. White rats were exposed to radioactive SO_2 and Na_2SO_3 by inhalation and injection. Following the inhalation of SO_2, its S-containing conversion products were rapidly distributed by the blood over the entire body and deposited in the organs where they were retained for 11 days and longer, depending upon the original concentration inhaled or injected. The distribution of S among the organs showed no pattern or regularity, except for the fact that lung tissues retained it in concentrations higher than did any other organ. In subcutaneous injections the S deposited in the lungs was in the form of sulfites. Upon repeated inhalation of $S^{35}O_2$ its conversion products containing S showed a tendency to accumulate in the body organs. The fact that products of SO_2 conversion became accumulated in the body organs leads to the assumption that daily inhalation of even low concentrations of SO_2 can develop pathologic processes in the body.

F-7138

Yanysheva, N. Ya.
THE EFFECT OF ATMOSPHERIC AIR POLLUTION BY DISCHARGES FROM ELECTRIC POWER PLANTS AND CHEMICAL COMBINES ON THE HEALTH OF NEARBY INHABITANTS. Gigiena i Sanit., 22(8):15-20, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 98-104, Jan. 1960.
CFSTI: TT 60-21049

A study was made of the effect of industrial discharges on the health of inhabitants of a large industrial center the atmospheric air of which was being polluted by the discharges of several production and manufacturing plants. A study was made of the degree of atmospheric air pollution with dust (fly ash), SO_2, sulfuric acid aerosol, hydrogen sulfide, chlorine, nitrogen oxides, and phenol. Air samples were collected by the aspiration method under the smoke plume coming from smoke stacks at distances ranging from 200 to 2,500 meters from a chemical combine and an electric power plant, and up to 800 meters from a phenol producing plant. The morbidity rate in two villages in the industrial area and one village in a control area was studied. Pollution of the atmospheric air with dust (fly ash), sulfurous gas, hydrogen sulfide in concentrations many times above the allowable limits and of aerosols of sulfuric acid and chlorine in concentrations just above the allowable limits, as well as the oxides of nitrogen and phenol within the limits of allowable concentrations deleteriously affected the population's health. It was concluded that the above mentioned pollutants produced the following pathologic results: (a) Increased by several times the frequency of occurrence among children and adults of diseases of the respiratory organs, of the nervous system, of the organs of vision and of the skin. (b) Lowered the resistance of the population to such infectious disease as the grippe and angina. (c) Induced in children a state of susceptibility to the development of rickets and anemia, and brought about early manifestations of diffuse pneumosclerosis in isolated cases.

F-7139

Gusev, M. I.

EFFECT OF LOW LEAD CONCENTRATION ON PORPHYRIN METABOLISM. Gigiena i Sanit., 22(8):21-25, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 105-110, Jan. 1960.
CFSTI: TT 60-21049

Male rabbits 3 and 4 months old were exposed to concentrations of lead approximating the limits of allowable concentrations for the air of work-rooms and also of atmospheric air. Chronic exposure of rabbits to lead oxide concentration of 10 g/m^3 daily for 6 hours over a period of 6.5 months increased the urine-eliminated coproporphyrin to 5.5 - 10.59 g per day. Exposure of similar duration to 3.9 g/m^3 of lead oxide failed to effect any quantitative changes in the urine-eliminated coproporphyrin of the tested rabbits.

F-7140

Senchuk, V. S.
THE EFFECT OF ATMOSPHERIC ULTRAVIOLET RADIATION INSUFFICIENCY ON MINERAL METABOLISM. Gigiena i Sanit., 22(9):9-14, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 111-117, Jan. 1960.
CFSTI: TT 60-21049

Atmospheric air of large industrial cities suffers a considerable loss in ultraviolet radiation as the result of air pollution. Observations made from March through October, 1956 indicated that the loss in ultraviolet radiation in Minsk ranged between 7 - 25 percent. During the fall and winter months pups kept under observation showed signs of disturbed inorganic (mineral) metabolism; this was expressed in the form of increased activity of alkaline phosphatase and a lowering in the blood level of inorganic phosphorus.

F-7142

Mel'nikova, E. A.
THE TOXICITY OF TITANIUM TETRACHLORIDE. Gigiena i Sanit., 23(5):27-31, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 122-127, Jan. 1960.
CFSTI: TT 60-21049

Previous investigation indicated that the toxic effect of titanium tetrachloride was defined by its property to hydrolyse to HCl. With this assumption in mind, this study was of the nature of a comparative investigation. The toxicity of HCl in statu nascendi and the toxicity of the aerosol formed by $TiCl_4$ in the process of its hydrolysis were compared. Mice were placed into a chamber of 12 liter capacity and exposed to the action of HCl obtained from NaCl heated in strong H_2SO_4, the HCl was introduced into the exposure chamber at the moment of its formation through a special opening in the chamber wall. The toxic effect of titanium tetracholoride was determined by its property to form HCl (gas) which under specially developing sets of physico-chemical conditions is able to permeate into and act upon the deeper lung tissues. Results of the study showed that the formed Ti aerosol possessed more intensive toxic properties than pure HCl. Accordingly, the limit of allowable concentration of HCl formed as a result of $TiCl_4$ hydrolysis should be set at a level below the one adopted for pure HCl.

F-7143

Lobanova, K. P.
TOXICITY OF DIMETHYLFORMAMIDE. Gigiena i Sanit., 23(5):31-37, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 128-136, Jan. 1960.
CFSTI: TT 60-21049

Experiments were designed to determine the acute and chronic toxicity of dimethylformamide using white mice and rats. Dimethylformamide belongs to the group of toxic substances which under certain conditions can elicit acute and chronic intoxication. The vapor tension of dimethylformamide is low; for this reason possibilities of acute poisoning with this substance in industrial manufacturing premises under conditions of normal temperature are very limited. Continuous (chronic) exposure to low dimethylformamide vapor concentrations, incapable of producing acute poisoning, elicited in the animal organism changes symptomatic of chronic intoxication, of which disturbance in higher nervous activity was the first to appear. Skin permeability of dimethylformamide appeared to be limited. Taking into consideration the physico-chemical and toxicological properties of dimethylformamide as determined by this investigation, it is recommended that 0.05 mg/l be provisionally accepted as the limit of allowable dimethylformamide concentration in the air of working premises.

F-7144

Kiryachko, B. S.
EFFECT OF CHRONIC LEAD POISONING ON THE IMMUNOLOGICAL REACTION OF THE ORGANISM. Gigiena i Sanit., 23(8):30-34, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 137-142, Jan. 1960.

Rabbits were divided into three groups of 10 each. Rabbits of Group No. 1 received typhoid vaccine only and served as controls; rabbits of Group No. 2 were immunized with typhoid vaccine before being subjected to lead intoxication; rabbits of Group 3 were subjected to lead intoxication before receiving the typhoid vaccine injections. Rabbits of Groups 2 and 3 received lead acetate. During the first 4.5 months the rabbits received daily 10 mg/kg of lead acetate, 20 mg/kg during the month following and 30 mg/kg thereafter. Immunization was made with killed S. typhosa vaccine containing 150 million bacteria per ml of saline. The vaccine was administered intravenously in doses of 0.5 ml for the first injection and 0.8 ml for the next two injections. Lead intoxication was accompanied by a reduction in the capacity to produce agglutinins in the course of immunization with vaccine. Such reduction in agglutinin generation became most pronounced in rabbits subjected to lead intoxication prior to the initiation of immunization injections. During the immunization, control rabbits developed a slight amount of acetylcholine and a simultaneous increase in blood serum cholinesterase activity, assumed to be indicative of the presence of humoral compensation. Rabbits subjected to lead poisoning after immunization with the typhoid vaccine accumulated a considerable amount of acetylcholine in the presence of a simultaneous reduction in cholinesterase activity. Lowered capacity to generate agglutinins and disturbed interstitial metabolism appeared much earlier than the classical symptoms of lead poisoning usually limited to changes in the blood picture.

F-7291

Gurinov, B. P., F. D. Mashbits, and L. M. Shabad
A STUDY OF THE BLASTOMOGENIC PROPERTIES OF SOME TARS DERIVED FROM ATMOSPHERIC DUST AND FROM COMBUSTION PRODUCTS OF DIFFERENT FUEL TYPES. Gigiena i Sanit., No. 10, p. 12-16, 1954. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 74-80, March 1960.
CFSTI: TT 60-21188

A study was conducted of the blastomogenic properties of some tarry substances, particularly of the products of combustion of various types of fuel, such as coal, wood, peat, oil, and its by-products, as well as of substances isolated from atmospheric dust. Samples were collected either by sedimentation or by aspiration and CC_{57} mice 2 to 3 months old were used as the experimental animals. The fur was removed from the skin between the shoulder blades and 10 percent benzene solution of the tar under study was applied to the exposed skin section about three times a week. The reactions observed were recorded up to the time of the death of the test animals. After that, and following autopsies, all tumors discovered were examined histologically. The data obtained strengthens the belief that the number of malignant tumors which developed in mice subjected to the applications of different tars, is to some extent related to the amount of 3,4-benzpyrene contained in the tars. Furthermore, on the basis of the results of experiments with test animals and of the spectral-fluorescence analysis of atmospheric pollutants, it can be stated that 3,4-benzpyrene, a carcinogenic substance, is present in the air of certain towns. (Authors' summary, modified)

F-7301

Shabad, L. M.
THE PRESENCE OF CARCINOGENIC SUBSTANCES, AND OF 3,4-BENZPYRENE IN PARTICULAR, IN THE ENVIRONMENT OF MAN. Vop. Onkol., 5(3):271-275, 1959. 35 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 141-146, March 1960.
CFSTI: TT 60-21188

The ability to produce experimental tumors in different organs and tissues by blastomogenic substances, presented the opportunity to make a detailed study of the origin and development of blastomata. Results of numerous experiments on the development of a variety of cancers carried out in the laboratory of the Institute of Oncology in Leningrad by a number of investigators indicated that four distinct phases were distinguishable in the development of all cancers: 1. Irregular diffuse pretumor hyperplasia; 2. focal proliferations, the precancer stage proper; 3. the so-called benign tumors; and 4. malignant tumors. Although the morphological changes may be different in different organs and may depend on a number of contributing factors, the basic characteristics of the process were identical in all cases. The enumerated states of development progressed from one into another without sharp demarcation; the development may become temporarily arrested at any one of the phases, or the arrest may become permanent and not attain the cancer phase. Tumors acquire specific cancer characteristics gradually in the process of development. This applies not only to the morphological characteristics, but also to the pathophysiological, biochemical and immunological characteristics. The mechanisms of the action of blastomogenic substances are unique and differ from the mechanisms of action of most stimulating agents. For instance, carcinogenic hydrocarbons suppress the inflammation and distort the course of the inflammatory reaction. The aforesaid illustrates that the study of carcinogenic substances considerably broadened the concept of the etiology and pathogenesis of malignant tumors and points to the means for their prevention in the following two ways: (1) early diagnosis and elimination of a precancerous condition, and (2) prevention of tumor formation by clearing the environment of carcinogenic agents.

F-7302

Mironova, A. T.
A STUDY OF THE POSSIBLE BLASTOMOGENIC PROPERTIES OF SOME SUBSTANCES RESULTING FROM THE PRODUCTION OF SYNTHETIC LIQUID FUEL. Vop. Onkol., 5(5):534-539, 1959. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 147-155, March 1960.
CFSTI: TT 60-21188

Mice were tested with the primary and finished products of the manufacture of synthetic liquid fuel. A total of 587 two-month old mice were used in the experiment, using from 40 to 50 animals for each sample. One small drop of the test material was applied twice a week to the interscapular area of the mice. After the third or fourth application alopecia of varying degree developed in the majority of the animals. In the mice treated with the primary products the alopecia was extensive, the skin was hard, crusty and cracked. Simultaneous falling out of the old and the appearance of new fur was observed throughout the period of application of the test substances. Treatment of the skin with the final synthetic product produced limited alopecia. The tests consisted of 50 applications, after which the mice were kept under careful observation up to the time of their natural death. The dead animals were preserved in 10 percent formaldehyde and histologic examinations made of sections of the skin parts to which the test substances were applied and of pathologically affected organs. Four of the five primary products tested caused skin cancer development at the site of application in 12 to 16 percent of the mice; this justifies the conclusion that the substances possessed mild, but definite carcinogenic properties. Among the seven final synthetic products of hydrogenation, two manifested slight blastomogenic properties; no carcinogenic properties were detected in five products of this group. The conclusion regarding positive carcinogenic properties possessed by two primary materials, namely, the heavy tar and the mazout from direct distillation, originally arrived at on the basis of 3,4-benzpyrene presence in these products, as indicated by fluorescent-spectral analysis, was confirmed by the results of tests with animals. The biological tests also established the blastomogenic properties of four additional substances which gave negative fluorescent-spectral tests, indicating that carcinogenic substances other than those which yield a positive 3,4-benzpyrene test may be present in the substances investigated.

F-7303

Ivanova, M. G. and I. S. Ostrovskaya
THE EFFECT OF ALUMINUM DUST ON THE ANIMAL ORGANISM. Gigiena i Sanit. No. 4, p. 21-27, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 167-174, March 1960.
CFSTI: TT 60-21188

White rats were exposed to aluminum dust by intratracheal injection, and rabbits were given the dust intravenously; both rats and rabbits were exposed to aluminum dust inhalation in chambers. A total of 54 rats and 30 rabbits was used. The experimental results showed that aluminosis produced by the administration of metallic aluminum dust was a new form of pneumoconiosis, which must be classed as another occupational dust disease. The use of aluminum in preventive and therapeutic treatment of silicosis requires a deeper and more extensive experimental and clinical study conducted on a broader basis than has been done heretofore. Careful supervision over workers' health including periodic medical examinations should be instituted in aluminum processing plants. Improvement in technical and sanitary anti-dust measures should be hastened to assure the successful fight against silicosis in the ore mining and other dust creating branches of industry.

F-7305

Khukhrin, E. V.
EXPERIMENTAL STUDIES OF THE BIOLOGICAL EFFECT OF INDUSTRIAL DUST IN RELATION TO THE METHODS USED. Gigiena i Sanit., No. 2, p. 29-32, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 181-184, March 1960.
CFSTI: TT 60-21188

A method is described for the exposure of animals to dust inhalation. A desired constant air dust concentration is created directly adjacent to the nares of the experimental animals. This is accomplished by placing a glass mask over the snout of an experimental animal through which the dust-laden air is inspired. It is essential that the animals be kept in a fixed position and the mask be firmly attached to insure uninterrupted inhalation of the dust-polluted air. A schematic illustrates the experimental set-up which consists of the following: a glass mask, atomizer, air-blower or aspirator, flowmeters, and the dust tube or adapter. It is possible to conduct tests on several animals simultaneously by attaching several assemblies by means of suitable connecting tubes and using a motor of adequate power. In this way, it is possible to conduct tests on control animals and, at the same time, to study the aerosol effect on a group of animals. It should be noted that some dusts will agglomerate and make uniform dust distribution impossible to attain. In such eventualities use should be made of the M. F. Bromley atomizer, also illustrated. With the aid of the described apparatus and procedures the effects of crystalline and amorphous silicon dioxide, aerosols of molybdenum, vanadium, and of different inorganic compounds were investigated. Results in all cases were reliably accurate.

F-7306

Novikov, Yu. V.
EFFECT OF SMALL BENZENE CONCENTRATIONS ON HIGHER NERVOUS ACTIVITY OF ANIMALS IN CHRONIC EXPERIMENTS. Gigiena i Sanit. No. 2, p. 20-25, 1956. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 185-191, March 1960.
CFSTI: TT 60-21188

Groups of three types of conditioned reflexes were developed in mice: two positive, (one strong and one weak), and one negative. The group pattern was as follows: 2 positive conditioned reflexes in response to a bell (strong); 2 positive conditioned reflexes in response to a red light (weak); 1 positive conditioned reflex in response to a bell (strong); 1 negative conditioned reflex in response to a buzzer; 2 positive conditioned reflexes in response to a bell; and 2 positive in response to a red light. After this pattern of motor conditioned reflexes had been established tests were made to determine the animal's type of higher nervous activity by extending differentiation to 3 min. and by testing the effects of 24-hour starvation. The average length of latent period of the second and third conditioned reflexes to bell ringing was thus calculated; first and second reflexes to red light stimulation, and average length of conditioned motor nutritional reflex reaction were calculated covering a period of ten days. The data thus obtained served as reference points for the evaluation of further changes in the conditioned reflex activity of the experimental animals. After having determined the typological characteristics of the rats' higher nervous activity, animals were separated into groups according to higher nervous activity types. Final test groups contained rats of every neurotype. Chronic exposure to 64 mg/m^3 of benzene vapor concentration produced functional changes in conditioned reflex activity of white rats. These changes were most marked in animals of weak and strong unbalanced type of higher nervous activity. In chronic intoxication with 13 mg/m^3 of benzene vapor no changes occurred in the activity of the cerebral cortex. Results presented can serve as physiological basis for the adoption of the limit of allowable benzene concentration in atmospheric air.

F-7307

Mogilevskaya, O. Ya.
THE EFFECT OF TITANIUM AND TITANIUM DIOXIDE AEROSOLS. Gigiena i Sanit. No. 3, p. 20-23, 1956. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 191-195, March 1960.
CFSTI: TT 60-21188

Results of an investigation of the physiological effects of titanium and titanium dioxide are reported. The aerosol samples consisted of dispersed particles, 85 to 87 percent of which had a diameter less than 2 microns. The aerosols were introduced into the animals by the blood-free intratracheal method. The animals were injected with a suspension of 50 mg of dust in 1 ml of physiological saline. Tests were made with 20 rats of which four controls were injected with pure physiological saline. Experiments were performed in 2 series: (1) intratracheal injection of metallic titanium dust, and (2) intratracheal injection of titanium dioxide dust. Throughout the duration of the experiments the animals remained healthy and gained weight. Six months later some of the rats were killed, the rest were reinjected with 50 mg of metallic titanium dust; 5 months later the test and control animals were killed. All animals including the controls were autopsied and none showed any macroscopic organ pathology. The experiments established that two intratracheal injections of 50 mg of metallic titanium or of titanium dioxide produced no nodular process or interstitial sclerosis in the lungs. Histologic changes noted after 11 months were limited to nodular lymph cell proliferation around the bronchi accompanied by slight sclerosis. There were accumulations of lymphoid and histiocytic cells around the dust particles fixed in the lungs. Because of the absence of pathologic manifestations in the animals during the experimental period and of the insignificant morphological changes in the lungs after intratracheal injection of large doses, dusts of metallic titanium or of titanium dioxide can be classed as nontoxic. The effects of fumes and of highly dispersed oxides can not be inferred from the results of this study; they must be determined by an appropriate special investigation.

F-7308

Koslova, T. A.
THE EFFECT OF BENZENE ON THE ORGANISM AT HIGH AIR TEMPERATURE. Gigiena i Sanit., 22(4):18-24, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 196-203, March 1960.
CFSTI: TT 60-21188

The study was conducted over the years of 1953 - 1955 along two channels: direct observations in a leatherette factory (the Nogin plant), and experimental studies with laboratory animals. Observations under direct factory conditions were conducted during the months of June, July, and August, when the temperature inside the work shops ranged between 20 and 42°, and again during the months of December, January and February when the air temperature of the work shops ranged between 20 and 28°. The control group consisted of individuals who lived under local climatic conditions free from benzene air pollution. The study covered blood pictures of 273 workers. The results showed that during the summer months, when the effect of benzene vapor on the workers was paralleled by high atmospheric temperature, the number of workers having anemias of moderate intensity increased (Hb. by Sahli hemoglobinometer was 55 percent and erythrocyte count below 4,000,000/mm^3). The number of workers showing signs of early leucopenia, with leucocytes below 5000/mm^3 also increased. In some workers the number of leucocytes fell during the summer months to 3800 and of thrombocytes to 8000/mm^3, pointing to the onset of a chronic state of benzene intoxication of I degree. The increase in benzene toxicity with increase in air temperature may have been due to the effect which increased temperature exerted on the rate of benzene permeation into tissues, its distribution rate and rate of toxicity neutralization by the organism and effect of temperature on the functional state of the nervous system (hyperthermic effect). The simultaneous exposure of animals to benzene vapor and elevated air temperature brought about a lowering in the resistance of the animal to temperature effects as indicated by increased disturbance in the processes of thermoregulation. There arises the possible need to determine differential limits of allowable benzene vapor concentrations in the air of industrial work rooms. This may apply equally to other gaseous air pollutants.

F-7309

Skvortsova, N. N.
POLLUTION OF ATMOSPHERIC AIR WITH CARBON MONOXIDE IN THE VICINITY OF FERRO-METALLURGICAL PLANTS. Gigiena i Sanit., 22(12):3-9, 1957. 18 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 204-212, March 1960.
CFSTI: TT 60-21188

Studies were conducted on 587 samples of atmospheric air surrounding ferro-metallurgical plants to determine CO concentrations. Studies were also conducted on 515 girls age 10 to 16 years to determine whether or not the potential danger of CO as a poison was due to chronic effects of small doses. The children were divided into three groups as follows: 1) 202 who continually resided within a radius of 2 km from the ferro-metallurgical plant which used blast furnaces; 2) 165 who continually resided within a radius of 1.5 km from the ferro-metallurgical plant which used open hearth furnaces; 3) 148 girls who continually resided in a control section free from industrial pollution. The girls were examined in their corresponding schools which were situated 800 to 900 meters from the basic sources of the industrial emissions. Determinations were made for carboxyhemoglobin, number of erythrocytes and hemoglobin by the Sahli scale. Subjective examination by the question method was also made. Concentrations of CO ranged between 5.6 to 190 mg/m^3 and in 78.8 to 93.5 percent of the samples the CO concentration exceeded the allowable limit for maximal single concentrations for atmospheric air. Simultaneous studies of atmospheric air and air of living quarters showed that a parallelism existed between the CO concentrations of the two. The results of this study indicated that industrial emissions which contained CO possessed the potentiality of affecting unfavorably the health of the younger inhabitants, as was evidenced by a high blood content of carboxyhemoglobin and by a tendency on the part of a large percent of the observed children to develop erythrocytosis, accompanied by subjective complaints characteristic of CO poisoning.

F-7311

Lupu, N. and K. Velikan
PNEUMOCONIOSIS IN CHILDREN OF INDUSTRIAL TOWNS THE ATMOSPHERIC AIR OF WHICH WAS POLLUTED WITH DUST CONTAINING SILICON. Gigiena i Sanit., 23(12):10-13, 1958. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 225-229, March 1960.
CFSTI: TT 60-21188

The atmosphere of the area under study was polluted with dust containing silicon dioxide from industrial plants. An investigation was conducted to determine whether the dust was causing changes characteristic of pneumoconiosis in children living in the vicinity of such sources of pollution. 800 school children 10 to 15 years old living in four industrial centers were examined. Two hundred children were selected from each city; one hundred were born and lived continually in the area most heavily polluted with dust; the other hundred were born and lived continually in relatively dust free areas. All the children underwent clinical and X-ray examination. The results of the X-ray examinations indicated that, in cities where the atmospheric air was polluted with industrial dust containing silicon dioxide, diffuse, weakly expressed pneumosclerosis was present in 10 to 15 year old children born and raised in areas with high pollution. Along with the concentration of dust and its chemical composition a contributing role in the development of diffuse pneumosclerosis may be played by acute and chronic lung diseases. On the basis of statistical data obtained as a result of examination of 70,000 children up to 15 years of age who lived in industrial centers, it was concluded that in the most contaminated areas of industrial cities there were discovered annually 3.32 times as many cases of lung tuberculosis, 5.46 times as many cases of pneumonia, 3.72 of broncho-pneumonia, 3.06 of bronchitis, suppurative processes, pleurisy, and other pulmonary diseases, and 5 times as many cases of influenzal conditions as in the control area. High morbidity in rickets, infectious diseases, dystrophies, anemia, rheumatic diseases, otitis, tonsillitis, and diseases of the digestive system were also observed.

F-7312

Kogan, A. G. and I. I. Lifshits
THE ROLE OF SILICON DIOXIDE AEROSOL CONDENSATE IN THE DEVELOPMENT OF SILICOSIS. Gigiena i Sanit., 23(8):63-66, 1956. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 230-236, March 1960.
CFSTI: TT 60-21188

Investigations were conducted in 2 plants making and processing quartz glass to determine the physiological effect of silicon dioxide condensate. Samples were collected from the surface of the terminal part of the exhaust ventilator in the glass blowing shop; the dust appeared as a light, smooth fluffy powder. Microscopically the dust particles appeared as large, flat, yellowish platelets of different forms measuring approximately 100 μ. The dust covering the hood hanging over the high frequency furnace was in the form of a firm powder. Microscopically the powder consisted of platelets ranging in size 10 to 15 μ. On the basis of the above it was concluded that condensates deposited on the surfaces of the air circulating systems of different processes differed structurally and in their degree of dispersion. Air samples from the melting rooms close to the gas furnaces were examined ultramicroscopically; 5,000 particles were suspended in the air at the position of the operator and only 1,000 particles 2 m farther away. Of the workers examined medically 50 were selected who had records of 3 to 12 years work as glass workers; of these, 28 were glass smelters and 22 were glass blowers. All the smelters were males; 14 of the glass blowers were women. In quartz glass manufacturing, the process of silicon smelting is accompanied by the liberation into the room of silicon dioxide vapors which rapidly undergo condensation in the air. The composition of vapors and of condensates differed with the methods of quartz glass smelting and depended on the original raw material and some other conditions. Results of periodic medical examinations of a group of workers with 3 to 12 years of work records offered no conclusive evidence that occupational pneumoconiosis developed in the workers, in spite of the fact that the quantity of silicon oxide in the air of the workshops exceeded the maximum allowable concentration. The above does not exclude the possibility that work at quartz glass smelting and blowing over periods exceeding 12 years might not cause pneumoconiosis.

F-7313

Vorob'eva, R. S.
OCCUPATIONAL LUNG DISEASES CAUSED BY PROLONGED ACTION OF CADMIUM OXIDE AEROSOL. Arkh. Patol., 20(3):25-28, 1958. 11 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 236-240, March 1960.
CFSTI: TT 60-21188

Results are presented of observations and experiments on changes in respiratory organs resulting from prolonged exposure to cadmium oxide aerosol. The observations and investigations were made in an alkaline accumulator plant. The cadmium content in the air of several departments ranged between 0.1 and 24 mg/m^3. A group of women, not over 44 years of age, whose anamnesis did not include diseases leading to pneumosclerosis, were selected for examination. Medical examinations made by specialists disclosed some cases of pneumosclerosis. Chest X-rays established that 5 out of 18 persons had initial symptoms of a chronic disease identified as a diffuse pneumosclerosis. Those who had pneumosclerosis had been working with cadmium for over 13 years. The workers of the plant were exposed to the action of several dust types, namely, cadmium oxide, and cadmium, iron, nickel, and graphite mixtures. This invalidated the determination of the exact etiology of the disease on the basis of the patients' examination alone. Experiments with animals were conducted by the method of intratracheal dust administration. Forty-four white rats were divided into four groups of 10 rats each, leaving four rats as the control group. The weight and behavior of the animals were observed and recorded periodically; after 4, 6, and 8 months they were decapitated. The internal organs were macro- and micro-analyzed. Histological preparations were examined and interpreted. The following types of dust were investigated: cadmium oxide, a mixture of 70 percent cadmium oxide and 30 percent ferrous oxide, and a 4:1 nickel hydroxide and graphite mixture. Results of the experimental investigation indicated that following the intratracheal administration of cadmium oxide dust to white rats an interstitial pneumonia developed which changed into pneumosclerosis; nodules of the epithelial cell type, and fibroblasts with subsequent sclerosis developed occasionally. These results led to the assumption that cases of pneumosclerosis seen during medical examination of workers exposed over long periods to cadmium oxide may be the result of cadmium dust inhalation.

F-7314

Kharkhurim, T. M. and S. G. Vigalok
PATHOLOGIC CHANGES IN THE LUNGS CAUSED BY HOT AIR INHALATION. Arkh. Patol., 20(8):29-31, 1958. 2 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 241-244, March 1960.
CFSTI: TT 60-21188

The effect of hot, dry air inhalation on the morphological changes in the lungs was studied experimentally in dogs. The respiratory tract of the animals was filled with hot dry air (temperature 130 to 135 C) for 3 to 4 minutes. This was done with a special apparatus through a tracheotomic opening. In the first two days after the experimental hot air inhalation, the changes in the lungs were characterized chiefly by circulatory disturbances, non-inflammatory in origin. A persistent spasm of the bronchi was revealed with disturbance of the mucous membrane. Sites of atelectasis of the lung tissue alternating with emphysema were found. In the following 3 to 7 days most cases manifested the above mentioned changes, and in addition, diffuse small foci of pneumonia developed. Specific changes of the vascular walls (proliferative peri- and endovasculitis) were also noted. On the 8th - 14th days the following lesions appeared: peribronchitis and catarrhal-desquamating bronchitis and secondary coalescent progressive catarrhal-hemorrhagic and purulent pneumonia. This was particularly true of the root of the lung. In the absence of secondary pneumonia processes, recovery of the normal structure of the lung parenchyma appeared on the 12th - 14th day after the experiment. Pneumonia in the laboratory animals followed a grave course with profound functional disorders in the other systems of the organism. (Authors' summary)

F-7315

Sadchikova, M. N.
CLINICAL ASPECTS OF ETHYLATED GASOLINE INTOXICATION IN AUTOMOBILE DRIVERS. Sovet. Med., 21(4): 99-102, 1958. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 245-250, March 1960.
CFSTI: TT 60-21188

A report is presented concerning the diagnosis of ethylated gasoline poisoning made between 1950 - 1954 at the Leningrad Institute of Industrial Hygiene and Occupational Diseases on 28 automotive vehicle drivers. Half of them had been in contact with the fuel for several months, others from one to three years, while 3 exceeded 5 years. In most of the 28 men examined the intoxication was not of grave character, following a mild acute or subacute course. They complained of continuous or recurrent headaches, undue fatigability, and vertigo. Some of them suffered from emotional disturbances and almost all slept poorly and had nightmares. Neurologic examination showed that half of the patients had lively tendon reflexes and some had finger tremors. The complex of autonomic nervous system symptoms characteristic of tetraethyl lead intoxication included bradycardia, hypothermy, and hypotonia. In the majority of the patients only isolated symptoms of this "triad" were observed. Observations indicated that personal idiosyncrasies and individual sensitivity to the toxic effect of ethylated gasoline played an important part in the development of chronic intoxication. Among the unfavorable factors were physical and mental traumas, alcoholism, and infections. Psychogenetic traits aggravated by alcoholism not only contributed to the development of the intoxication, but markedly affected the clinical picture and the course of the intoxication. Mental disturbances which frequently appear in such patients helped in prolonging the course of intoxication. The mild forms of chronic intoxication observed in drivers were generally reversible and ended in complete recovery. Most effective treatment consisted of extended sleep combined with intravenous injection of a 40 percent glucose solution, vitamins, pine baths, and other types of physiotherapy. A number of case histories are included.

F-7316

Alexeyev, A. Ye.
THE CENTRAL NERVOUS SYSTEM AND THE PHARMACODYNAMICS OF SOME VAPOR FORMING SUBSTANCES INHALED WITH THE AIR. Farmakol. Toxilogiya, 18(6):22-24, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 251-254, March 1960.
CFSTI: TT 60-21188

A study was conducted to determine whether the central nervous system plays an important role in the penetration of pharmacological agents through the alveolar membrane. Frogs were used as cold-blooded and white rats as warm-blooded animals. The study was made by the method of heart-lung preparation retaining its connection with the central nervous system; therefore, the method can be described as the heart-lung-brain-preparation method. The frogs were anesthetized and the thoracic cavity opened; blood vessels were ligatured in the following order: both cutaneous arteries, then both basal arteries, inferior vena cava and subclavian veins. In this way the pulmonary and and carotid arteries and the internal and external jugular veins and the pulmonary veins remained open; through them blood was supplied to the brain via a small circuit. The posterior part of the frog's body was severed between the thoracic and lumbar vertebrae. A tube was then inserted into the trachea connecting the latter with a device for artificial respiration; heart contractions were registered kymographically. When a frog woke from narcosis, as was indicated by the appearance of protective reflexes in the eyes or skin in response to needle prick, the administration of the test substances was begun. An intact frog served as control and its heart action was registered. Tests were made with chloroform, formalin, and paraldehyde. It was demonstrated that the central nervous system played an important part in regulating and directing lung membrane function. Severing the connection between the lung membrane and the central nervous system substantially affected the pharmaco-dynamics of some vapor forming pharmacological substances inhaled with the air. Volatile narcotics such as chloroform, and vapor forming substances such as paraldehyde freely permeated through the lung membrane which changed their pharmaco-dynamic effects when the connection between the lungs and the central nervous system remained intact.

F-7472

Roshchin, I. V.
THE EFFECT ON THE ORGANISM OF THE AEROSOL LIBERATED BY THE BESSEMER PROCESS. [Aerozol', obrazuyushchiisya pri konverternom peredele chuguna, i ego gigienicheskaya otsenka.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(1):31-36, Jan. 1967.
CFSTI: 67-51409/1

Over a period of several years, the dust factor was studied in the course of all the principal operations involved at a smelter. The dust concentrations in the vicinity of the converter, mixer, and crane operators were very considerable; the dust concentration in the air of the shop was stable. The largest quantity of aerosol came from the converter necks. Less dust was generated in the course of mixing, pouring the pig iron, charging the ore, and discharging the semi-finished products and slags. Electron microscopy showed that in the disperse phase, spherical particles, characteristic of a condensation aerosol, predominated. Chemical analysis of 20 samples of the dust aspirated from the air and deposited on the equipment showed 3.4 to 5.2 percent of total SiO_2 and 1 to 2.1 percent free SiO_2 in the disperse phase, while the carbon content reached 1 percent. The content of the other admixtures, --chromium, manganese, and vanadium and sulfur-- did not exceed 0.5 percent each. As the chromium, manganese, and vanadium in the dust are trivalent, their toxicity is relatively low. About 85 to 93 percent of the disperse phase is made up of iron oxides. On x-ray examination pneumoconiosis was found in 7 workers and suspected pneumoconiosis in 3 workers. Four workers showed stage II pneumoconiosis, while in the rest it was in the first stage. The capability of aerosol from the converter shops to cause pneumoconiosis was confirmed by intratracheally administering 50 mg portions of settled dust, in the form of a suspension, to 30 albino rats weighing 180 to 230 g. The animals were kept under observation for about 15 months. Groups of animals were killed at 3-month intervals and their organs were microscopically examined. Animals autopsied three months after administration of the dust showed a mild acinous emphysema and small subpleural accumulations of dust. Animals killed after 6 months showed increased pulmonary emphysema, and after 15 months this was still more marked. No pathological changes were found in other internal organs. It is recommended that the maximum permissible dust level in converter shops should be $6\ mg/m^3$.

F-7473

Gorodinskii, S. M., S. V. Levinskii, and V. L. Shcherbakov
THE MAXIMUM PERMISSIBLE CONCENTRATIONS OF VARIOUS HARMFUL SUBSTANCES INHALED IN GAS MIXTURES WHEN USING A CLOSED-CIRCUIT RESPIRATORY APPARATUS. [O norminovanii vrednykh primesei vo vdykhaemikh gazovykh smesyakh pri ispol'zovanii izoliruyushchikh apparatov.] Hygiene and Sanitation,

(English translation of: Gigiena i Sanit.), 32(1):48-54, Jan. 1967. 22 refs.
CFSTI: TT 67-51409/1

In these studies, the following factors were observed and recorded: energy expenditures; changes in circulatory and respiratory function (ECG, arterial pressure, respiratory rate, spirometry, pulmonary ventilation); thermal regulation (rectal temperature, skin temperature at 5 points, loss of weight); and CNS changes (working capacity). The tests were mainly carried out under working conditions, using self-recording instruments. The subjects were questioned about their feeling of well-being in the course of the tests. Blood tests were also carried out, including the carboxyhemoglobin content. On the basis of experimental findings and of data from the literature, maximum permissible concentrations for the harmful impurities liberated by the human body in inhaled gas mixtures are recommended.

F-7475

Gusev, I. S.
A COMPARISON OF THE EFFECTS OF LOW CONCENTRATIONS OF BENZENE, TOLUENE AND XYLENE. [Sravnitel'maya otsenka deistviya malykh kontsentratsii benzola, toluola i ksilola.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(2):159-163, Feb. 1967. 7 refs.
CFSTI: TT 67-51409/1

Investigation of the effects of exposing animals to low concentrations of benzene, toluene and xylene over a prolonged period of time (85 days) is described. The 105 male albino rats used were divided into seven groups: 15 animals in each group. Purified air was supplied to the chamber containing the first group of animals (controls) at a rate of 30 to 35 l/min. The other chambers were supplied, at the same rate, with air containing admixtures of the vapors with the substances in question. The concentrations of benzene, toluene and xylene in the chambers were checked daily. Concentrations of 15 mg/m^3 caused marked changes in cholinesterase activity and in the white blood count of animals continuously exposed to these substances over a prolonged period of time. The magnitude of the changes increased from benzene to xylene, while the rate of rediscovery diminished in the same direction. Toluene in a concentration of 0.6 mg/m^3 and xylene in a concentration of 0.2 mg/m^3 produced no effect on the experimental animals throughout the period of exposure, so that these may be recommended as the mean daily maximum permissible atmospheric concentrations. Since little is known regarding the absence of cumulative properties when low concentrations of benzene are involved, the mean daily maximum permissible concentration should remain at the present level of 0.8 mg/m^3, which is only half the noneffective concentration of this substance established by the above experiments.

F-7565

Pogosyan, U. G.
THE EFFECT ON MAN OF THE COMBINED ACTION OF SMALL CONCENTRATIONS OF ACETONE AND PHENOL IN THE ATMOSPHERE. [Sovmestnoe deistvie malykh kontsentratsii atsetona i fenola v atmosfernom vozdukhe na organizm cheloveka.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7):1-9, July 1965. 3 refs.
CFSTI: TT 66-51033/3

The results of an experimental study on the effect of phenol and acetone, when jointly present in the inhaled air, are given. A study of the reflex effect of micro-concentrations of acetone and phenol on the human body (olfactory organ, light sensitivity of eyes, electric cerebral activity) revealed a complete summation of their effects. In order to investigate the resorptive action of a mixture of acetone and phenol, a three-month long chronic poisoning test was undertaken. The general state, the behavior and the weight kinetics of the experimental animals were observed, and motor chronaxie of the muscle-antagonists and the activity of the blood cholinesterase were studied. The content of coproporphyrin and that of certain vitamins (C, B$_1$, B$_2$, and N'-methylnicotinamide) in the urine was determined. Concentrations of acetone and phenol, ten times greater than the recommended one-time maximum permissible concentration of acetone and phenol in combination, cause shifts in the motor chronaxie of muscle-antagonists, in cholinesterase activity and a rise in the content of coproporphyrin and certain vitamins in the urine. The one-time maximum permissible concentration of phenol and acetone in the atmosphere expressed in amounts of permissible concentration for each substance when present separately should not exceed 1.0. The daily average maximum permissible concentration of acetone and phenol, when jointly present in the air, is recommended to be on the level of the one-time maximum concentration. (Author's summary, modified)

F-7569

Bykhovskii, A. V. and S. G. Malakhov
HOT PARTICLES IN THE ATMOSPHERE (A REVIEW OF THE LITERATURE). [Problema goryachikh chastits v atmosfernom vozdukhe (Obzor literatury).] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7): 104-115, July 1965. 63 refs.
CFSTI: TT 66-51033/3

The systematic investigation of hot particles in the atmosphere started in 1957-1958. Systematic measurements have led to the conclusion that the maximum concentrations of hot particles correspond to nuclear tests. At such times, one aerosol particle of activity above 1.10^{-10} curie occurs on the average in 100 or 1000 m^3 air, while particles with an activity exceeding 5.10^{-12} curie occur in a few or dozens of cubic meters of air. Obviously, dust particles that are capable of causing microscopic necrosis when retained by the respiratory organs must come under the control of hygienists. However, a complete hygiene assessment of the dangers presented by such particles will require comprehensive research. In 1963-1964, the conclusion of the Moscow treaty on the suspension of nuclear tests in three media was followed by a considerable reduction of the concentration of hot particles in the atmosphere, so that the possible danger to the population of radioactive decay energy has diminished. On the other hand, the formation of hot particles is not prevented during work with radioactive materials. Further studies are necessary on the health, geophysical, and biological aspects of this subject.

F-7571

Retnev, V. M.
OCCUPATIONAL HYGIENE AT AN AUTOMATED ASPHALT-CONCRETE FACTORY. [Gigiena truda na avtomatizirovannom predpriyatii po proizvodstvu asfal'tobetona.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(7):133-136, July 1965. 2 refs.
CFSTI: TT 66-51033/3

A study of the working conditions at the factory revealed dust concentrations at the control panel of 9 plus or minus 2 mg/m^3. The working conditions were more favorable from a hygienic standpoint than those in old factories, as indicated, for instance, by the concentrations of dust and carbon monoxide in the air. At the same time, one cannot ignore the presence of dust containing free silicon dioxide, the concentration of which was somewhat in excess of the maximum permissible concentration (4 mg/m^3 allowed by Sanitary Standards SS 245-63). The measures required for other sections of the factory include thermal insulation of heated surfaces (to keep the external temperature down to 35 C); installation of air showers at the worksite, at the boilers for heating the petroleum bitumen, and at the drying drums; hermetic sealing of dust-producing equipment; and application of suction to ball mills, screens, mixers, and batchers. The noisy general equipment (ball mills) should be housed in a separate hall. The noise must be reduced in all sections of the factory, this being the management's most difficult task at present. Workers who come into contact with the dust must undergo mandatory periodic medical examinations. Some of the measures for improving the working conditions suggested to the management have already been implemented.

F-7573

Tkach, N. Z.
COMBINED EFFECT OF ACETONE AND ACETOPHENONE IN THE ATMOSPHERE. [Kombinirovannoe deistvie atsetoma i atsetofenona v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(8):179-185, Aug. 1965. 7 refs.
CFSTI: TT 66-51033/3

When acetone and acetophenone act together, their odors are completely summated. The combined effect of acetone and acetophenone on ocular sensitivity to light and electrical activity of the brain displays complete summation. When acetone and acetophenone are simultaneously present in the atmosphere, their maximum one-time concentration, expressed in fractions of the accepted separate maximum permissible concentrations, should not exceed 1.5. Prolonged poisoning of albino rats with acetone and acetophenone concentrations of 1.855 and 0.0165 mg/m^3 (the sum total of the fractions of their separate maximum permissible concentrations being 10.9) for 84 days caused disturbances of the normal chronaxial ratio of antagonistic muscles, inhibited the activity of cholinesterase, increased the excretion of coproporphyrine and 17-ketosteroids in the urine, and produced eosinopenia. No effect was produced by an acetone plus acetophenone mixture having a total concentration of 1.2. In the case of the combined presence of acetone and acetophenone in the atmosphere, their mean daily concentration expressed in fractions of their separate maximum permissible concentrations should not exceed 1.2.

F-7574

Statsek, N. K.
MAXIMUM PERMISSIBLE CONCENTRATION OF DICYCLOHEXYLAMINE NITRITE IN THE AIR OF FACTORIES. [Materialy k gigienicheskomu normirovaniyu nitritaditsiklogeksilamina v vozdukhe prozvodstvennykh pomeshchenii.] Hygiene and Sanitation (English Translation of: Gigiena i Sanit.), 30(8):208-212, Aug. 1965. 3 refs.
CFSTI: TT 66-51033/3

Dicyclohexylamine nitrite (DAN) is an inhibitor of the atmospheric corrosion of ferrous metals and belongs to a class of aminocyclic compounds. On intragastric introduction, LD$_{50}$ of this compound for mice amounts to 80 mg/kg and for rats 325 mg/kg, no local irritating effect was noted. Repeated inhalation of DAN in the form of vapors at a concentration of 0.009, 0.004, and 0.002 mg/l produces no signs of intoxication. The maximum permissible concentration of DAN in the air of the working zone is recommended to be at a level of 0.001 mg/l. (Author's summary)

F-7577

Korneev, Yu. E.
EFFECT OF THE COMBINED PRESENCE OF LOW CONCENTRATIONS OF PHENOL AND ACETOPHENONE IN THE URBAN ATMOSPHERE. [K voprosu o deistvii na organizm malykh kontsentratsii fenola i atsetofenona pri sovmestonom prisutstvii ikh v atmosfernom vozdukhe naselennykh mest.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(9):336-345, Sept. 1965. 11 refs.
CFSTI: TT 66-51033/3

The joint action of small concentrations of phenol and acetophenone were studied. In the presence of phenol and acetophenone in the atmospheric air a complete summation of their effect occurs. The index of the total concentration of the active mixture in the tests amounted to 1.0; values below this level were ineffective. The relation of the sum of their inefficient mixture in the encephalographic investigation to the existing maximal permissible concentrations of phenol and acetophenone in the atmosphere amounted to 1.5. This level is recommended as the one-time maximum permissible concentration of phenol and acetophenone when both are present in the atmosphere. The resorptive action of a mixture of various concentrations of phenol and acetophenone in the body of experimental animals was studied under conditions of a long-term inhalation poisoning test. The total concentration of these substances at a level of 1.19 proved to be ineffective for animals under conditions of long-term experiment. The daily average permissible concentration for the mixture of phenol and acetophenone is suggested at a level of 1.2. An investigation of atmospheric pollution in the district of a synthetic phenol production showed that at a distance of 500 m the maximum one-time concentration of phenol was 8.7 times higher than its maximum permissible and that of a acetophenone - 9.3 times. At a distance of 1000 m the investigated substances could not be detected in the air. The width of the sanitary protection zone for such enterprises can be set only after examining the atmosphere for all the ingredients present in the production discharges.

F-8148

Glebova, L. F.
ESTABLISHING MAXIMUM ALLOWABLE CONCENTRATION OF HYDROGEN SULFIDE IN ATMOSPHERIC AIR. Gigiena i Sanit., No 4, p. 19-21, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 98-101, May 1960.
CFSTI: TT 60-21475

To determine the effect which hydrogen sulfide and carbon disulfide may have on the human organism, observations were conducted in nurseries on children 1 month to 3 years old. Observations conducted in the nurseries of the viscose-rayon factories showed that a peculiar complex symptom frequently appeared in breast-fed infants whose mothers worked in the spinning shop. Examination of the air under the upper garments of the mothers (at the point of infant breast feeding) revealed the presence of hydrogen sulfide in small concentration; no carbon disulfide was detected. The disappearance of the clinical symptoms after mothers were moved to different type of work established the fact that such symptoms were caused by the hydrogen sulfide present in the air inhaled by the breast-fed infants. Daily prolonged inhalation of slight amounts of hydrogen sulfide (0.1 to 10 mg/m^3) is known to produce a definite symptom complex manifested as undernourishment, delayed growth, general weakness, retarded development, digestive disturbances, tendency to vomiting and diarrhea, conjunctivitis, catarrh of the upper respiratory tract, bronchitis and furunculosis. This was accompanied by increased susceptibility to infectious diseases; immunoresistance decreased and a peculiar sensitization to certain toxine developed.

F-8149

Popov, I. N., Ye. F. Cherkasov, and O. L. Trakhtman
DETERMINATION OF SULFUR DIOXIDE ODOR THRESHOLD CONCENTRATION. Gigiena i. Sanit., No. 5, p. 16-20, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 102-106, May 1960.
CFSTI: TT 60-21475

The threshold of concentration of olfactory sensitivity to sulfur dioxide in atmospheric air was investigated to determine its relation to the recommended standard maximum concentration of sulfur dioxide in the air, and to ascertain whether the odor receptor apparatus could be used in the control of concentrations of noxious odor-emanating gases in the air. The determination of threshold concentrations of sulfur dioxide odor perception was made by the dynamic method. An analysis of the data obtained showed that a concentration of sulfur dioxide up to 0.004 mg/li (4 mg/m^3) could not be detected by odor. Concentrations of sulfur dioxide within the limits of 0.004 to 0.0065 mg/li were perceived by the majority of test subjects as having a strong odor and by only a few as having a faint odor. Concentrations of sulfur dioxide above 0.0085 mg/li were determined as having a very sharp odor. Data available in literature on determining the threshold of odor perception of sulfur dioxide present a somewhat different picture. The present sanitary regulations in Russia prescribe 0.25 mg/m^3 as the maximum daily average SO_2 concentration and 0.75 mg/m^3 as the maximal single SO_2 concentration in atmospheric air. Results of this investigation show such concentrations to be above the threshold of SO_2 odor perception. It is suggested that they be replaced by results of more recent and more sensitive studies.

F-8150

Itskovich, A. A.
THE STIMULABILITY OF THE OLFACTORY ANALYSER IN THE HYGIENIC EVALUATION OF ATMOSPHERIC AIR POLLUTION. Gigiena i Sanit., No. 8, p. 9-11, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 106-109, May 1960.
CFSTI: TT 60-21475

The functional shifts in the human organism which resulted from atmospheric air pollution by volatile products of the coke-chemical industry were investigated. The effect of these substances on the state of the olfactory analyzer in various population groups was used as the selective index of pollution effects. In the selective group-studies crystalline phenol and thymol were used as the odor-emanating substances. Tests were made on 241 individuals divided into 4 groups. Group 1 consisted of workers and technical personnel of a coke-chemical plant; group 2 consisted of residents within 500 to 1000 m from the production plant; group 3 consisted of school children living in the same area; group 4 consisted of employees of the Sanitary Institute who had no direct connection with the source of the atmospheric air pollution. Determinations made with the aid of the Elsberg-Levy olfactometer showed that in 66.6 percent of workers under study and of persons residing 500 to 1000 m from the coke-chemical plant the threshold of coke-chemical odor perception was above normal. The same was true of 50 percent of the youngsters of school age. The results of olfactory threshold determinations were in complete agreement with the anamnestic data secured from the same population groups. The changes observed in the olfactory sensitivity of the groups were of a specific character and could be regarded as effects of the coke-chemical atmospheric air pollutants. It was noted that persons with pronounced changes in the olfactory sensitivity resided within 500 to 1000 m from the source of atmospheric air pollution where, according to analysis, the concentrations of phenol compounds in the air ranged between 0.167 - 0.237 mg/m^3. This should be taken into consideration in the determination of the limit of allowable concentration of phenol in atmospheric air.

F-8152

Takhirov, M. T.
DETERMINATION OF LIMITS OF ALLOWABLE CONCENTRATION OF CHLORINE IN ATMOSPHERIC AIR. Gigiena i Sanit., 22(1):13-18, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 119-125, May 1960.
CFSTI: TT 60-21475

Studies of air in the vicinity of an industrial chemical plant indicated that the air in the proximity of the plant was regularly polluted with chlorine. A study of the air of Moscow indicated that the atmospheric air was polluted with chlorine even at considerable distances from sources of pollution. The threshold of Cl odor perceptibility of odor-sensitive persons was at the 0.8 mg/m^3 level. The threshold of Cl effect on the reflex sensitivity of the eye to light coincided with the threshold of odor perception. The Cl threshold effect on reflex activity as manifested by changes in rhythm and amplitude of respiratory movements was at the 1.5 mg/m^3 Cl concentration level, which coincided with the level established by the chronaxymetric method. The limit of allowable concentration of Cl (0.1 mg/m^3) adopted by the U.S.S.R. for atmospheric air of inhabited localities is below the threshold of Cl odor perception and also below the level of its reflex effect via the receptors of the upper parts of the respiratory tract. The maximal daily average concentration of free Cl in the air of central Moscow was 0.034 mg/m^3, which is slightly above the recommended level of 0.03 mg/m^3. This clearly indicates that the Moscow air can not admit any additional Cl discharges and that the construction of new industrial plants which discharge chlorine into the atmospheric air should be prohibited.

F-8153

Izmerov, N. F.
HYGIENIC STANDARDIZATION OF THE LIMITS OF ALLOWABLE CONCENTRATIONS OF VAPORS OF GASOLINE IN ATMOSPHERIC AIR. Gigiena i Sanit., 23(2):8-14, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 126-134, May 1960.
CFSTI: TT 60-21475

The physiological effects of low air concentrations of gasoline were studied. On the basis of the experimental results it can be concluded that the inhalation of gasoline vapors in 100 mg/m^3 concentration under conditions of chronic exposure elicited in white rats clear cut changes in the higher nervous activity, the intensity of which increased with the duration of the exposures, and which disappeared only two weeks after exposure was discontinued. In the case of man the inhalation of gasoline vapors in concentration of 217 mg/m^3 for a brief period of time elicited reflex changes in the optical analyzer so far as sensitivity to light was concerned. The threshold of gasoline odor perception was considerably below the concentrations which elicited the previously noted changes in the functional state of the cerebral cortex; the odor perception threshold concentration was between 6.5 - 10.0 mg/m^3. It appears safe to conclude that the threshold of olfactory gasoline odor perception is the most sensitive index for the determination of limits of allowable concentrations of gasoline vapors in atmospheric air. It is proposed in Russia that a concentration of 5 mg/m^3 calculated as C be adopted as the allowable limit of a single maximal concentration of the three grades of Groznensk gasoline investigated.

F-8154

Melekhina, V. P.
MAXIMUM PERMISSIBLE CONCENTRATION OF FORMALDEHYDE IN ATMOSPHERIC AIR. Gigiena i Sanit., 23(8): 10-14, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 135-140, May 1960.
CFSTI: TT 60-21475

The atmospheric air in the vicinity of the chemical plant under investigation was systematically polluted with formaldehyde, the concentration of which was as high as 0.04 mg/m^3 even at a distance of 1000 meters from the plant. Investigations of atmospheric air polluted with formaldehyde caused by auto traffic and the exhaust of diesel propelled motor vehicles varied from 2 to 10 mg/m^3 and 49 to 378 mg/m^3 formaldehyde, respectively. The threshold concentration of olfactory sensitivity to formaldehyde for the majority of persons under observation was 0.07 mg/m^3. A concentration of 0.05 mg/m^3 was non-perceptible to most sensitive persons. The threshold formaldehyde concentration affecting reflex reaction as determined by the chronaxy method was 0.03 mg/m^3, and 0.07 mg/m^3 was the subliminal concentration. The formaldehyde threshold concentration of cortical reflex effect obtained by the adaptometric method rested in most sensitive persons at the level of 0.098 mg/m^3. In studying the influence of small or low formaldehyde concentrations on man the method of determining threshold concentration of odor perception was the most sensitive, the result being 0.07 mg/m^3. Maximum permissible single formaldehyde concentration in atmospheric air should not exceed 0.035 mg/m^3.

F-8164

Plotnikova, M. M.
ACROLEIN AS AN ATMOSPHERIC AIR POLLUTANT. Gigiena i Sanit., 22(6):10-15, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 188-194, May 1960.
CFSTI: TT 60-21475

Atmospheric air pollution with acrolein discharged from a drying oil factory in Russia was determined colorimetrically. It extended as far as 1000 meters from the source of pollution in concentrations exceeding the allowable limit. Its hygienic effects in different concentrations were studied. The threshold of olfactory acrolein perception for the majority of the test individuals was at 0.8 mg/m^3. The threshold of acrolein effect on the reflex reaction and on optical chronaxy was at 1.75 mg/m^3, and at 1.5 mg/m^3 in the case of respiratory rhythm and wave amplitude. The threshold effect of acrolein on the functional state of the brain cortex as indicated by changes of reflex reaction and determined adaptometrically was established at 0.6 mg/m^3, which is below the threshold of acrolein odor perception. Tests indicated that 0.3 mg/m^3 of acrolein can be taken as the limit of allowable maximum concentration.

F-8167

Trakhtenberg, I. M.
THE TOXICITY OF VAPORS OF ORGANIC MERCURY COMPOUNDS (ETHYLMERCURIC PHOSPHATE AND ETHYLMERCURIC CHLORIDE) IN ACUTE AND CHRONIC INTOXICATION. (EXPERIMENTAL DATA). Gigiena i Sanit., No. 6, p. 13-17, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3 p. 205-210, May 1960.
CFSTI: TT 60-21475

Inhalation by white mice of vapors of organic mercury compounds, such as ethylmercuric phosphate and ethylmercuric chloride, caused acute or chronic poisoning varying in severity with the duration of exposure and vapor concentration. Poisoning by the mercury compounds followed a definite course and terminated in the death of the animals. Acute poisoning seriously affected respiration and, to a lesser degree, the nervous system. In chronic intoxication, the control nervous system was basically affected. Vapors of ethylmercuric phosphate and chloride proved more toxic than metallic mercury vapor.

F-8168

Leonova, Yu. I.
THE MECHANISM OF IRON ORE DUST ACTION ON ANIMALS AND MAN. Arkhiv. Patologii, 20(3):60-65, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 211-218, May 1960.
CFSTI: TT 60-21475

The nature of tissue reaction to ferric oxide and the possibility that iron ore dust containing small amounts of silicon caused lung fibrosis was investigated. White rats and dogs were exposed to inhalation of air polluted with iron ore dust in a chamber. Upon completion of the tests, animals were sacrificed at different time periods; maximum period of dust inhaling was 16 months for the rats and 24 months for the dogs. Histologic examination was made of the tissues of a miner, age 22 years who died in an accident, after working in a mine underground for 3 years and 4 months. Iron ore dust which found its way into the upper parts of the respiratory tract was phagocytized by the so-called "dust cells" which form "dust cell islands." Iron ore dust was eliminated via the bronchi and the lymphatic channels. Gradual lung saturation with iron ore dust resulted in the voluminous accumulation of the dust in the peribronchial and perivascular lymphatic spaces and in the lymphatic channels under the pleura. In chronic cases of exposure to iron ore dust inhalation there developed a blockade of the pulmonary lymphatic channels and of the pleura; along with this there was an accumulation of the dust in the lymphatic vessels of the mediastenum, epicardium and diaphragm; large dust accumulations occurred in the local lymph nodes and also in the lymph nodes situated beyond the limits of the thoracic cavity (mesenteric, peribronchial, cervical and minor stomach curvature). Disturbance of dust-saturated lymph and blood circulation was accompanied by a disturbance in the oxidation-reduction system, a reduction in the respiratory lung area and by an accumulation of products of tissue metabolism; in totality these deviations from the physiological normal appeared as the probable cause of interstitial sclerosis; this assumption is supported by the fact that iron ore dust per se possessed no toxic properties.

F-8173

Kuznetsova, L. V.
SPECTROGRAPHIC DETERMINATION OF MANGANESE IN ANIMAL ORGANS AND TISSUES. Gigiena i Sanit., No. 10, p. 48-50, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 11-14, Aug. 1960.
CFSTI: TT 60-21913

Accumulation and distribution of manganese in tissues and organs was studied with a Hilger-type spectrograph equipped with a quartz lens of 10 cm focal length. The electric arc image was projected on a background with a rectangular aperture facing the collimator slit located 3 cm from it, so that the points of carbon electrodes would not run into the slit. This was necessitated by the fact that the radiation coming from the incandescent electrode points is replete with molecular spectral bands which seriously hamper the analysis of the spectrum. The arc intensity was kept constant at an 8 A level. A slit 0.02 mm wide was used for qualitative analysis, and a slit 0.1 mm wide for quantitative analysis. A 0.02 g per 0.02 ml solution of $BeSO_4$ was used as the standard. This study was made with spectrally pure carbon electrodes 6 mm in diameter. A hole was drilled in each carbon 3.5 mm in diameter and 4 mm deep. Solution of the standard was poured into the drilled hole and the carbons were dried. The carbon electrodes thus prepared were then filled with the ash of the organ under investigation and used in the quantitative analysis. Samples for analyses were ashed in the usual way, and the weight of the ash determined in relation to the original weight of the raw tissue. A weighed portion of the ashes was then used in the final spectral analysis as described above.

F-8174

Kotov, G. N.
IMPROVED EXPERIMENTAL TOXICOLOGICAL METHOD OF ANIMAL INHALATION EXPOSURE. Farmakol. i Toksikol., 20(2):70-73, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 24-29, Aug. 1960.
CFSTI: TT 60-21913

The described apparatus and procedure enables an investigator to obtain vitograms and automatic kymographic recordings of changes in respiration, pulse beat, and blood pressure under active exposure conditions, inside the treatment chamber. A "universal stanchion" is used consisting of a wooden or metal frame into which the test animal is fixed to maintain a standing position. The stanchion, which is illustrated, is essentially a modification of the Pavlov frame. A cannula is inserted in the animals femoral or carotid artery and the animal is then secured in the stanchion in a standing position. In preparation for the vitogram record only the rear legs are fastened securely, allowing the front legs to move freely. The animal's struggles will cause the free legs to exert some pressure on a movable disc in the middle part of the stand. The pressure on the disc will be recorded on the kymographic tape. Recording of respiration is done with the help of a rubber cuff fastened around the animal's chest. The blood pressure is recorded via the cannula inserted into the artery, and connected by means of fine rubber tubing filled with a 30 percent sodium citrate solution to a graduated Ludvig manometer.

F-8175

Lyublina, E. I.
CALCULATING "PHYSICAL" TOXICITY FOR THE PRELIMINARY DETERMINATION OF MAXIMUM PERMISSIBLE CONCENTRATIONS. Gigiena Truda i Prof. Zabolevaniya, 2(2):41-47, 1958. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 30-37, Aug. 1960.
CFSTI: TT 60-21913

New substances are being steadily introduced into the production industry, some of which possess properties deleterious to health. It is imperative that methods be found for the rapid determination of maximum allowable concentrations in the air of such substances before their production and industrial utilization assume extensive proportions. Clinical, statistical and animal experimental data frequently prove inadequate for this purpose. The rapid determination of limits of allowable concentrations of air pollutants should be based on general principles derived from a study of the action of a significant number of different substances. Four methods of calculating maximum allowable concentrations from physiochemical properties are introduced. The values derived by these methods are compared with the maximum permissible concentrations fixed by law or suggested by Soviet industrial toxicologists. This was done for 53 organic substances. The results of a statistical analysis of data obtained by the four formulas are presented.

F-8186

Roschin, I. V.
HYGIENIC ASPECTS OF INDUSTRIAL VANADIUM AEROSOL. Gigiena i Sanit., No. 11, p. 49-53. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 109-114, Aug. 1960.
CFSTI: TT 60-21913

An investigation was made of the health hazards due to vanadium at a ferro-vanadium smelting operation. Measurements of vanadium pentoxide were made at several locations within the plant. The acute and chronic effects of vanadium were studied by exposure of white rats. The most characteristic manifestation of vanadium toxicity was disturbance of the circulatory system, primarily vasodilatation and blood stasis in the vessels of internal organs. These changes assumed a regional character: they were observed only in the lungs and apparently lead to a disturbance in vascular permeability; they involved pulmonary lymphostasis accompanied by a lowered drainage function which enhanced the development of the pulmonary pathological processes. In acute intoxication the disturbance in the circulatory system embraced the most important regions of the body, such as the organs in the thoraco-abdominal cavity and the cerebrum. Recommendations are made for maximum allowable concentrations.

F-8187

Golubev, A. A.
THE PECULIAR RELATIONSHIP BETWEEN AIR CONCENTRATIONS OF SOME VOLATILE SUBSTANCES AND THE

DEVELOPMENT OF PULMONARY EDEMA. Gigiena Truda i Prof. Zabolevaniya, 1(4):46-50, 1957. 12 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 122-127, Aug. 1960.
CFSTI: TT 60-21913

Exposure of mice to the inhalation of vapors of vinyl propyonate and of vinyl butyrate elicited toxic pulmonary edema and a state of narcosis. The development of pulmonary edema by these vapors is enhanced by an increase in the concentration of the esters only up to corresponding maxima; concentrations of the ester vapor above such maxima induce in the exposed animals a state of narcosis and produce a less marked pulmonary edema.

F-8188

Mel'nikova, E. A.
THE TOXICITY OF HIGHLY DISPERSED CADMIUM OXIDE AEROSOL. Farmakol. i Toksikol., 21(2):72-77, 1958. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 133-140, Aug. 1960.
CFSTI: TT 60-21913

Early physiological functional indexes were sought for the timely discovery of cadmium intoxication symptoms, particularly symptoms manifested by the nervous system, so that prophylactic sanitary measures could be instituted without delay. Animals were exposed to cadmium oxide aerosol and changes in chronaxy were studied by means of a condenser-chronaximeter. Flexor and extensor motor chronaxy determinations were made of the right side posterior extremity. Conditioned reflexes were also investigated by developing a response in white mice to red light and ringing of a bell and to the sound of a buzzer. A single inhalation of cadmium oxide in 0.013 to 0.018 mg/l will disturb the conditioned-reflex activity considerably ahead of the appearance of other intoxication indications. Repeated exposure to cadmium oxide in concentrations ranging from 0.0018 to 0.002 mg/l brought about disturbances of the conditioned-reflex activity, without any observable changes in the general condition or behavior of the animals. The nature of chronaxy changes in acute and chronic cadmium intoxication are dissimilar. In the first case the chronaxy changes were more pronounced in the extensor group, and in the second case they were more pronounced in the flexor group.

F-8190

Elfimova, E. V.
DETERMINATION OF LIMIT OF ALLOWABLE CONCENTRATION OF HYDROCHLORIC ACID AEROSOL (HYDROGEN CHLORIDE) IN ATMOSPHERIC AIR. Gigiena i Sanit., 24(1):13-20, 1959. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 144-153, 1960.
CFSTI: TT 60-21913

An analytical method is described for the determination of HCl in air. Results of measurements of HCl concentrations in the vicinity of a magnesium plant are presented. Olfactory thresholds and the effects of the HCl sensitivity of the eye to light, changes in vascular reactions, and pulse rate are also discussed.

F-8191

Shalamberidze, Yu. P.
THE DETERMINATION OF LIMITS OF ALLOWABLE CONCENTRATION OF LEAD SULFIDE IN ATMOSPHERIC AIR. Gigiena i Sanit., 24(3):9-14, 1959. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 154-160, Aug. 1960.

Quantitative lead determinations were made in the air surrounding a lead ore processing plant. The dust in the atmospheric air consisted of particles 79.16 percent of which were up to 5 microns in size. Lead content in washings from the inner side of window panes indicated that lead dust penetrated into the dwellings. At 250 m from the plant the lead content amounted to 1.07 mg/m^2/24 hrs; at 400 m it was 0.73 mg/m^2/24 hrs; and at 500 m - 0.19 mg/m^2/24 hrs. An increased content of lead was noted in the soil within the community area. Rats were exposed to lead dust six hours daily, with the exception of non-working days, for a period of six months. Daily exposure to lead sulfide dust of 48.3 g/m^3 brought about a gradual development of functional changes in the conditioned reflex activity, some histopathologic changes in the brain and lungs, and a definite accumulation of lead in the bone tissue. Similar chronic exposure to 13.5 g/m^3 concentration of lead resulted in some lead retention in the organism and brought about negligible pathomorphological changes in some organs. On the basis of this investigation it is suggested that 1.7 g/m^3 be adopted as the limit of allowable concentration of lead sulfide in atmospheric air.

F-8201

Demidenko, N. M.
THE EFFECT OF MIXED INDUSTRIAL DUST ON THE ORGANISM. Gigiena i Sanit., No. 11, p. 26-29, 1954. 13 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 243-247, Aug. 1960.
CFSTI: TT 60-21913

Knowledge of the combined action of mixed dust is essential for the determination of hygienic limits of allowable dust concentration in the air, and for the rational selection of means for the protection of sanitary working conditions in mixed dust generating industries. Mixed dust containing quartz and hematite (ferric oxide), quartz and fluorite, quartz and coal, and quartz and chalk were investigated. Chalk dust was used as bulk material in the preparation of mixed dust samples of uniform component ratios. Each dust mixture consisted of 50 percent quartz and 50 percent admixture. The dust mixtures were introduced intratracheally in four series of tests using white rats. Animals were kept under observation 6 to 8 months, then sacrificed and their internal organs were fixed in 10 percent formalin. It was shown that: a) dust mixtures containing 50 percent silicon dioxide and 50 percent coal or hematite had a less pronounced pathogenic effect than the same percentage of silicon dioxide alone; b) fluorite admixture did not lower the effect of silicon dioxide but changed its character; this may be regarded as due to an added increase in pathogenic effect of such a mixture of dusts. Differences in the chemical nature of the dust components may necessitate a change in the limit of allowable dust concentration arrived at on the basis of the primary component alone.

F-8203

Bobyleva, A. T., R. M. Bukhantseva, S. E. Lovtsova, and M. S. Sadilova
DUST CONCENTRATION IN RESIDENTIAL DISTRICTS OF ASBEST CITY AND ITS EFFECT ON THE CHILDREN'S HEALTH. Gigiena i Sanit., 23(11):9-12, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 251-254, Aug. 1960.
CFSTI: TT 60-21913

Air was sampled for asbestos dust at different distances from three asbestos plants during 1950. The air of residential districts was found to be heavily polluted with asbestos dust. A survey was made of morbidity among children living in the area and it was concluded that pollution from the asbestos plants was affecting the health of the children.

F-8208

Yanes, Kh. Ya.
BASIC DATA FOR THE HYGIENIC EVALUATION OF DUST FROM COMBUSTIBLE SHALE. Gigiena Truda i Prof. Zabolevaniya, 1(3):20-23 1957. 10 refs. Translated from Russian by B. S. Levine U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 1-6, Jan. 1961.
CFSTI: TT 61-11149

The effects of Esthonian combustible shale dust were studied by experiments on white rats and rabbits. Animals were exposed to dust inhalation in a (dynamic) dust chamber for 4 hours daily over 8 months; they were observed for an additional 6 months after the termination of exposure. Experiments were divided into 3 series: 1) shale dust in concentration of 355 mg/m^3; 2) ditto in concentrations of 3 to 20 mg/m^3, and 3) enriched shale dust in concentration of 350 mg/m^3. Prior to using the enriched shale dust, 2/3 of its inorganic matter was removed to determine the part played by the organic substances. A slight tendency to develop anemia was observed in the peripheral blood of test animals exposed to high concentrations of the usual shale dust. These changes persisted to the end of the exposure. Similar changes were observed in the animals exposed to enriched shale dust. Animals subjected to high concentrations of shale dust manifested a 10 to 22.7 percent arrest in growth. Beginning fibrose pneumoconiosis was observed in animals exposed to 8 months of dust and sacrificed 4 to 6 months after exposure; it was also seen in animals subjected to the enriched shale dust. No substantial differences were found between the effects of the usual and the enriched shale dusts, indicating that the deleterious effect of combustible shale dust was caused not by the mineral constituents alone. Microscopic observations made with tissues and organs of 20 white rats exposed to high shale dust concentrations showed signs of pulmonary inflammatory processes in the form of organic broncho-pneumonia. A hygienic inspection of the working conditions, changing in the test animal organisms caused by the shale dust inhalation, as well as analysis of the clinical and morphological data emphatically pointed to the importance of the sanitary-hygienic problem existing in the combustible shale industry.

F-8210

Vysamyae, A. Yu.
THE CARCINOGENIC EFFECT OF SHALE FUEL SOOT ON WHITE MICE. Vopr. Onkol., 4(4):408-411, 1958. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 191-195, Jan. 1961.
CFSTI: TT 61-11149

The cancerogenic properties of shale fuel soot were investigated. Experiments were performed with 218 white mice. The benzene extract of the shale fuel soot was applied to 100 mice twice every week for approximately 25 weeks, or 50 applications. Eighteen control mice were treated in a manner described above with 2 drops of a mixture of benzene and vaseline. The basic control group consisted of 100 white mice which received no treatment of any kind. Special-fluorescent analysis showed that 3,4-benzpyrene was present in soot of shale fuel; benzene extract of such soot, applied to the skin of mice, or injected subcutaneously, produced malignant growths, indicating that it possessed cancerogenic properties. Papillomas appeared 5 months after the application of the benzene soot extract to the skin of the experimental mice. Most of the malignant formations resulting from the application of the soot extract to the skin of the experimental mice were malignant epitheliomas, more often squamous cell carcinomas, occasionally cytoblastomas, which frequently metastasized into the local and lung lymphatic nodes. Benzene extract of the shale fuel soot appeared to be free of general systemic toxic properties. The mixture of benzene and vaseline used as the soot extract vehicle had no blastomogenic properties. Results of the investigations point to the urgent need of adopting energetic measures for the prevention of air contamination with shale fuel soot.

F-8212

Kaplun, Z. S. and N. V. [illegible]
HYGIENIC EVALUATION OF AEROSOLS FORMED IN THE MANUFACTURE OF HARD ALLOYS. Gigiena i Sanit., 24(6):16-22, 1959. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 52-59, Jan. 1961.
CFSTI: TT 61-11149

To determine the effect of dust containing a mixture of carbides of tungsten, titanium, and metallic cobalt, experiments were performed with white rats which were administered, intratracheally, dust mixtures of 3 kinds. The first contained 8 percent cobalt and 92 percent tungsten: the second contained 15 percent cobalt and 85 percent tungsten; and the third contained 8 percent cobalt, 14 percent titanium, and 78 percent tungsten. Animals were observed over periods of 6 and 8 months, after which they were sacrificed. The anatomicopathologic examinations of the organs showed that most pronounced changes occurred in the lungs. Mixed dust containing carbides of tungsten, titanium and cobalt must be evaluated on the basis of the most toxic component, which in the case under study, was cobalt. In the majority of cases cobalt content of the mixed air-suspended aerosols in the hard alloy industry in question exceeded the proposed maximum allowable concentration of 0.5 mg/m^3; because of the high Co content the mixed air-suspended dust should not exceed 2 mg/m^3 in Russia.

F-8215

Prokhorov, Yu. D. and A. A. Rogov
HISTOPATHOLOGICAL AND HISTOCHEMICAL CHANGES IN THE ORGANS OF RABBITS AFTER PROLONGED EXPOSURE TO CARBON MONOXIDE, SULFUR DIOXIDE, AND THEIR COMBINATION. Gigiena i. Sanit., 24(6):22-26, 1959. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 81-86, Jan. 1961.
CFSTI: TT 61-11149

Prolonged exposure of rabbits to carbon monoxide, sulfur dioxide, and mixtures of the two gases produced dystrophic changes in the parenchymal organs and increased the permeability of vascular walls. Carbon monoxide, sulfur dioxide, and their combinations inhibited the activity of free SH groups in the brain, but not in any of the other organs. Prolonged exposure of rabbits to the inhalation of air containing 0.2 mg/li of CO enhanced the activity of succinic dehydrogenase in the myocardium, the liver, and the kidneys. The addition of an equivalent concentration of carbon monoxide to a given concentration of sulfur dioxide depressed considerably the activity of succinic dehydrogenase in the parenchymal organs.

F-8216

Kravchenko, A. A., A. E. Pasternak, R. M. Larchenko, and L. I. Sokolova
DISEASES OF THE UPPER RESPIRATORY PASSAGES AND OF THE EAR AMONG WORKERS OF THE SERPUKHOV ZANARSKAYA SPINNING-WEAVING MILL. Gigiena i Sanit., 24(6):48-51, 1959. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 94-97, Jan. 1961.
CFSTI: TT 61-11149

The morbidity rate among workers of a spinning-weaving mill was studied over a 2-year period showing a high percentage of sick workers: 72.6 percent in 1954 and 64.2 percent in 1955, on the basis of average yearly employment. In 1954 the repeater group (4 times a year and more) amounted to 12.9 percent of all sick cases and 34.6 percent of all days absent. The highest rate of morbidity with temporary loss of work capacity was caused by the grippe and by acute catarrhal conditions of the upper respiratory tract, which amounted to 24.5 percent in 1955, of which 21 percent were acute catarrh of the upper respiratory tract. These and angina accounted for 33.9 percent of all cases of morbidity. In 1956 an attempt was made to detect early diseases, which required dispensary observation, by otorhinolaryngologic polyclinical examinations of 458 workers; 70 persons had symptoms of thyrotoxicosis. Dispensary service continued during 1957 with 1012 persons under observation; of these 472, or 46.6 percent manifested rhinolaryngological changes. Otorhinolaryngological diseases were revealed in 53.8 percent of workers in the preparatory department, in 44.1 percent in the spinning workshop of the spinning mill and in 51.3 percent in the weaving workshop. Among the administrative and supervisory personnel, otorhinolaryngological changes were found in 27.3 percent. Chronic hypertrophic rhinitis and pharyngitis were detected in 31 workers. Subatrophic rhinopharyngitis was found in 78 workers of whom 54 were from the preparation and spinning workshops of the spinning mill. In 1957 the predominant number of workers had subatrophic rhinopharyngitis; in 1956 the picture changed to atrophic rhinitis. Apparently the introduction of masks and of close dispensary service played a positive role in the improvement of the condition of the workers' upper respiratory tract.

F-8217

Lemon, M. I.
OBTAINING A CONSTANT DUST CONCENTRATION IN A "DYNAMIC" DUST CHAMBER. Gigiena i. Sanit., 24(7):75-77, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 98-101, Jan. 1961.
CFSTI: TT 61-11149

A dust chamber used in animal experimentation in hygienic research is described. The chamber consists of several "stories", each housing 4 animals, such as rabbits or cats; each individual chamber section can be operated independently. The principal chambers can be built to consist of several "stories" to house 4, 8, 12, and 16 experimental animals. In its assembled state the dust chamber is a cylinder of 0.6 m inner diameter equipped with 2 upper and lower cones. The chamber is of airtight construction. The experimental animals are placed into cages firmly held in special cage adapters distributed along the cylindrical chamber wall. Each sectional chamber is provided with a special observation window and a traphole for cleaning and other purposes. The dust is supplied into the chamber based on the principle of dust "aeration" or "blow-in." The dust supply and distributor is a hollow glass cylinder having a metal screen as its bottom; the screen has 40 1 mm^2 openings; directly below the screen is a pressure chamber into which compressed air is entered whenever so required. The upper part of the cylinder is closed by a lid having 2 openings, one for the delivery of dust, and the other for the supply of the stock dust. The lid is also equipped with dust reflecting cones; the cones act as even dust dispersers. The compressed air entering the pressure chamber passes through the metallic screen and through a layer of dust dispersing it through an exposure chamber; the required dust density is attained by controlling the rate of compressed air inflow, that is the quantity of dust per unit time. To insure an even and constant dust density within the exposure chamber, it was necessary to shake the dust distributor at given time intervals; this was attained by attaching the distributor to the compressor head; as the compressor vibrated, the dust distributor vibrated with it shaking the dust loose.

F-8218

An, A. S.
EFFECT OF SULFUR DIOXIDE ON VITAMIN C BALANCE IN THE ANIMAL ORGANISM. Gigiena i. Sanit., 25(3):34-40, 1960. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 102-107, Jan. 1961.
CFSTI: TT 61-11149

The vitamin C balance in the rabbits and guinea pigs suffering from sulfur dioxide intoxication was determined. Inhalation of SO_2 brought about a fall in blood vitamin C content. The extent of reduction in blood vitamin C depended upon the duration of exposure to and the concentration of the SO_2. Short duration exposure to SO_2 inhalation was followed by a sharp drop in blood vitamin C levels. Prolonged exposures to SO_2 inhalation resulted in a preliminary rise in the ascorbic acid content of the blood, succeeded by a sharp fall. Results of experiments with guinea pigs, which did not synthesize vitamin C showed that the immediate rise in the concentration of blood vitamin C following the inhalation of high SO_2 concentrations was not the result of enhanced ascorbic acid biosynthesis by the organism. It can be assumed that the splitting of bound ascorbic acid may have been responsible for it. The administration of vitamin B_1 (thiamine), or of ascorbic acid (vitamin C), prevented the fall of the ascorbic acid level in the blood normally caused by exposure to the inhalation of SO_2 in the air.

F-8219

Tarnopol'skaya, M. M. and T. G. Osetinskii
EFFECT OF CEMENT DUST ON RESPIRATORY ORGANS. Sov. Med., 21(8):90-94, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution

and Related Occupational Diseases, No. 5, p. 108-113, Jan. 1961.
CFSTI: TT 61-11149

In studying the effect of cement dust on the organism, a large group of cement plant workers were clinically examined. Cement dust caused considerable changes in the upper respiratory tract. Cement dust formed concrements and coated the nasal mucosa; this made nasal respiration difficult, created mucous membrane trauma, and nose bleeding. Atrophic changes in the nasal mucous membrane, pharynx and larynx predominated among cement industry workers. Prolonged periods of work in the cement industry led to the formation of pulmonary fibrosis (cement pneumoconiosis) of limited localization and equally limited progressive development. Pulmonary emphysema should be regarded as an early symptom of incipient cement pneumoconiosis. Two clinical case histories are also included.

F-8220

Kirichinskaya, I. A.
SEQUELAE OF SEVERE CARBON MONOXIDE POISONING. Sov. Med., 22(11):152-154, 1958. 22 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 115-119, Jan. 1961.
CFSTI: TT 61-11149

The after-effects of severe CO poisoning of a middle aged man are described. The poisoning first followed a favorable course: during 5 days of hospitalization his condition improved to such an extent that the was sent home and allowed to return to work after 4 days. Nine days later he began to manifest mental changes which necessitated his confinement to a psychiatric hospital. Objectively he exhibited an akinetic syndrome with symptoms of diffuse damage of the cerebral vessels. The mental disturbances that arose during the later period of intoxication following the brighter interval, appeared to have been the results of vascular pathology. The impairment of blood vessel penetrability in CO poisoning often leads to the development of bronchopneumonia, as in the case under consideration. The present case indicates the need for prolonged observation of persons who have had carbon monoxide poisoning and such persons should be hospitalized for not less than a month after the intoxication.

F-8221

Grigor'ev, Z. E.
EFFECT OF VOLATILE SUBSTANCES AND OF GASES ON THE HIGHER NERVOUS ACTIVITY OF WHITE RATS IN THE COURSE OF INHALATION EXPOSURE. Farmakol. i Toksikol., 18(4):49-52, 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 125-130, Jan. 1961.
CFSTI: TT 61-11149

A tightly closing chamber was built which could be used simultaneously for the development of light, sound, and motor nutrition conditioned reflexes in rats, and for their exposure to the inhalation of gas, vapor, or dust under investigation. Some data of the effects of gasoline vapor and of carbon monoxide on the central nervous system of rats are presented to illustrate the suitability of the chamber described for the recording of rats' conditioned reflex activity changes on a dynamic basis while they are being exposed to the inhalation of gases, vapors, or suspended dust.

F-8222

Vasil'eva, O. G.
DISTRIBUTION AND ELIMINATION OF S^{35} IN ANIMALS AFTER INHALATION OF LABELED SULFURIC ACID AEROSOL. Gigiena Truda i. Prof. Zabolevaniya, 1(3):39-43, 1957. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 130-136, Jan. 1961.
CFSTI: TT 61-11149

Rats were exposed to the inhalation of S^{35} sulfuric acid to secure data which might explain the fate of H_2SO_4 which enters the living organism. Sulfuric acid aerosol rapidly penetrated into the blood stream following a single inhalation exposure of animals. The products of sulfuric acid conversion were distributed by the blood into the body organs and tissues, in which they persisted for 10 days or longer. Sulfur-containing products of sulfuric acid conversion were distributed among the organs and tissues in an uneven manner. They were first localized in the lungs, blood, liver, and large intestine. During the early days after inhalation exposure, the accumulation of sulfur-containing products progressively increased in the large intestine, the feces and in the urine. Labeled sulfur-containing sulfuric acid conversion products were eliminated through the intestinal tract and through the kidneys. The bone marrow absorbed considerable quantities of sulfur-containing substances. S^{35} persisted in the bone marrow in considerable amounts for several days after a single one hour exposure to $H_2S^{35}O_4$ aerosol inhalation. The data herein presented point to the possible resorption of sulfuric acid aerosol.

F-8258

Reiter, Reinhold and K. Pötzl
THE DESIGN AND OPERATION OF A RESPIRATORY TRACT MODEL. STAUB (English translation), 27(6):19-27, June 1967. 19 refs.
CFSTI: TT 67-51408/6

The structure and operation of a physical model of a respiratory tract is described, which simulates in four stages the retention of particles in the tracheal, bronchial and alveolar chambers of the human respiratory tract. Practical application of the instrument is explained in detail by a series of investigations on suspended particles. The results obtained are discussed and compared with those given in experimental and theoretical studies by other authors.

F-8259

Simecek, Jaroslav
COMPARATIVE INVESTIGATION OF METHODS FOR PARTICLE SIZE DETERMINATION. STAUB (English translation), 27(6):33-37, June 1967. 6 refs.
CFSTI: TT 67-51408/6

Comparative measurements were carried out to determine particle size distribution of quartz and fly ash. Eleven methods for particle size determination have been investigated and their suitability for industrial and hygienic purposes has been tested. The problem of fibrous dust (asbestos, textile dusts) determination remains unsolved.

F-8339

Tomingas, René
SOOT HAZARDS INVESTIGATED FROM THEIR CARCINOGENIC ASPECTS. STAUB (English translation), 27(8):8-10, Aug. 1967. 3 refs.
CFSTI: TT 67-51408/8

Experiments carried out on rats show that subcutaneous implantation of benzopyrene combined with soot can cause sarcomata. The result is affected by the high number of soot eruptions. Sarcoma yield depends on complete remainder of the implantate. The investigation of the residual implantate in the case of rats has shown that, if the action in an animal body is sufficiently long, benzopyrene is completely eliminated from the implantate.

F-8382

Okhnyanskaya, L. G., V. T. Petrova, and A. A. Vernikova
ASSESSMENT OF RESPIRATORY FUNCTION IN INDIVIDUALS EXPOSED TO SILICIOUS DUST. Federation Proc. Transl. Suppl. (English translation of: Gigiena Truda i Prof. Zabolevaniya (Medgiz)), Vol. 25, p. T657-T660, July-Dec. 1966. 14 refs.

The determination of the best criteria for the assessment of respiratory function in silicosis and the development of a method for general evaluation was investigated. A combination of respiratory indices is suggested, embodying simplicity of method and apparatus. About 2000 miners and foundry workers, as well as 96 patients with dust-induced chronic bronchitis were examined. The control group consisted of 200 individuals who had not been exposed to the effects of silicious dust. The combination suggested includes indices such as the vital capacity of the lungs, two-stage determination of vital capacity, forced vital capacity of lungs, pneumotachometric and spirographic indices, and maximum pulmonary ventilation. The results of these determinations on the test subjects are tabulated. All these investigations can be carried out with any Krog type metabolimeter and an electrokymograph capable of various speeds of rotation. Each is determined two or three times, after which the highest values for all indices, except respiration rate, are selected; the lowest respiration rate is used. The combination of indices suggested will reveal early changes in respiration resulting from exposure to silicious dust. The combined assessment of these indices represented in a number of graphs, affords a picture of the dynamics and details of change in respiratory function as the silicotic process advances, and of the effectiveness of prophylactic and therapeutic measures.

F-8387

Al'terman, N. A. and S. F. Sorokina
DISEASE INCIDENCE IN UNDERGROUND WORKERS IN MERCURY MINES. [O zabolevaemosti podzemnykh rabochikh rtutnykh shakht.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):37-40, July-Sept. 1966. 8 refs.

The medical reports of 458 underground workers for 1961-1963 were analyzed. The majority were 21-40 years old, while only 7.5 percent of the subjects were over 50 years of age. Some workers (31.5 percent) had worked in the mercury mines for up to five years; 33.2 percent, up to 10 years; 24.4 percent, up to 15 years; and 10.9 percent had worked longer than 16 years. The incidence of industrial trauma, tonsillitis and radiculitis decreased significantly between 1961 and 1963. During this period the average incidence per 100 workers for grippe was 3.3; for upper respiratory tract infections, 15.3; for tuberculosis, 0.5; and 7.7 for tonsillitis and exacerbation of chronic tonsillitis. A comparison of workers in coal mines and in mercury mines indicates that the mercury mine workers suffer most frequently from grippe and upper respiratory tract infections, while the coal miners suffer principally from industrial trauma. Furthermore, the length of work experience, age, and occupation are directly related to the incidence of morbidity in the mercury mine workers. Thus, incidence of emphysema increased markedly, from 4.4 per 100 workers with work experience of up to five years, to 30.8 per 100 workers with experience of 16 to 20 years. Occupation is related to incidence of certain diseases; acute upper respiratory tract infection and radiculitis were higher in the cutters, who also had a higher incidence of chronic bronchitis (often combined with emphysema). These mercury mine workers developed silicosis after working an average of 15 years; in another mercury mine, silicosis appeared after an average service of 4.5 years. This difference is related to the reduction of dust in the mines (by a factor of seven) following the introduction of wet drilling with napthenate soap. Bronchitis is regarded as an occupational disease related to the presence of aerial dust in the mine.

F-8431

Tsulaya, V. R.
THE SANITARY AND TOXICOLOGICAL CHARACTERISTICS OF THE EFFECT OF A MIXTURE OF BENZENE AND ACETOPHENONE VAPORS IN THE ATMOSPHERE. [Sanitarno-toksikologicheskaya kharakteristika kombinirovannogo deistviya smesi parov benzola i atsetofenona v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):6-10, April-June 1967. 11 refs.
CFSTI: TT 67-51409/2

As a result of studying the reflex action of a mixture of benzene and acetophenon vapors on the human body, it is concluded that the effect produced by this mixture is the summation of effects of the two substances. An investigation of the resorptive action of a mixture of benzene and acetophenon vapors in a concentration of 9.2 and 0.030 mg/m^3 consecutively revealed a series of shifts in the central nervous and hemopoietic systems and the nucleic acids content in the blood of experimental animals. A mixture of benzene and acetophenon vapors in a concentration of 0.91 and 0.0030 mg/m^3, consecutively, had no noxious effect on experimental animals. (Author's summary)

F-8432

Yakim, V. S.
THE MAXIMUM PERMISSIBLE CONCENTRATION OF SEVIN IN THE AIR OF THE WORK ZONE. [Materialy k obosnovaniyu predel'no dopustimoi kontsentratsii sevina v vozdukhe rabochei zony.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):32-36, April-June 1967. 5 refs.
CFSTI: TT 67-51409/2

The toxicity of sevin (1-naphthyl-N-methylcarbamate), an insecticide of a very wide activity range was studied after introduction into the animal body through the gastrointestinal tract, the respiratory organs and mucous membranes and under the existing working conditions in agriculture. The finding was that sevin is less toxic than methylmercaptophose, M-81, chlorophose (inhalation effect) and phosphamide. On the basis of experimental data obtained and the field observatiors made, the maximum permissible concentration of sevin in the air of a working zone is recommended to be set at a level of 1 mg/m^3. (Author's summary)

F-8434

Radionov, A. D., A. N. Chumachenko, and I. I. Kirilenko
THE TOXIC PROPERTIES OF THE HERBICIDE 2,4-D. [O sanitarnotoksikologicheskio kharakteristike gerbitsida 2,4-D-natrievoi, aminnoi i dimetilaminnoi solei 2,4-dikhlorfenoksiuksusnoi kisloty.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):116-118, April-June 1967.
CFSTI: TT 67-51409/2

The herbicide 2,4-D (sodium, amine and dimethylamine salts of (2,4-dichlorophenoxy) acetic acid) must be used strictly according to the regulations, otherwise it causes considerable, though transient, disturbances, including irritation of skin and of the mucosae of the eyes and throat, weakness, headache, nausea, sometimes vomiting, and occasionally loss of consciousness and other signs. A differential symptom of poisoning with 2,4-D (sodium salt) is a salty taste in the mouth. The danger presented by the herbicide to human health is increased at relatively high air temperatures (20°C and above in the cases described) and in dry weather. Under these conditions, more dust is generated and the plants and upper soil strata lack the moisture which would partially prevent atomization of the herbicide into the air; another result of the soil desiccation is inactivation of the soil microflora. The harmful effects of the herbicide on human subjects may appear for up to 14 days, and possibly more, after treatment of the fields, in dry weather; further experiments on laboratory animals are therefore needed. No cases of poisoning with the herbicide 2,4-D were recorded in 1963, a year in which manual working of crops was not permitted after treatment with the herbicide. It may therefore be assumed that the pulverized and evaporated herbicide mainly gives rise to poisoning in workers engaged in the manual tilling of crops. When the fields are tilled by mechanical means, lesser amounts of the pulverized and evaporated herbicide reach the respiratory zone of the workers. Manual work should not be permitted on fields that have been treated with 2,4-D. Mechanization must be substituted and this should not take place throughout the day but only early in the morning, when the air temperature is relatively low and air humidity high. The workers should employ means of individual protection (respirators, goggles, gloves, overalls). The wind direction must also be taken into account. It is desirable that a shower be taken directly after work. The irritant effect of the herbicide on the skin, eyes, throat and nose mucosae may be counteracted by washing with dilute solutions of soda, since 2,4-D is decomposed by alkalies.

F-8435

Pylev, L. N.
EFFECT OF THE DISPERSION OF SOOT IN DEPOSITION OF 3,4-BENZPYRENE IN LUNG TISSUE OF RATS. [Znachenie dispersnosti sazhi v deponirovanii 3,4-benzpirena v legochnoi tkani krys.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):174-178, April-June 1967. 8 refs.
CFSTI: TT 67-51409/2

The cancerogenic substances present in the environment are found as absorbates in soot and dust particles. The elimination of 3,4-benzpyrene from the lung tissue of 120 rats was studied when introduced in combination with various types of carbon black. The quantity of 3,4-benzpyrene extracted from the lungs of killed rats was determined with the aid of spectrophotometer SF-4A. Channel black was bound to retain benzpyrene in the lung tissue while thermal decomposition black promoted its quick elimination. (Author's summary)

F-8440

Evenshtein, Z. M.
TOXICITY OF ALUMINUM AND ITS INORGANIC COMPOUNDS. [K voprosu o toksichnosti alyuminiya i neorganicheskikh alyuminiisoderzhashchikh soedinenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):244-249, April-June 1967. 28 refs.
CFSTI: TT 67-51409/2

In spite of the controversial nature of reported data on the toxicity of aluminum, analysis of the work done in this field suggests that there is no need to limit the household and consumer uses of this metal and its alloys. The amounts of aluminum hydroxide produced by the thermal processing of foodstuffs in aluminum ware can hardly be dangerous to human health. On the other hand, the presence of soluble aluminum salts in food is undesirable since their toxicity with respect to warm-blooded animals has been confirmed by many investigators. More attention should probably be paid to the presence of insoluble aluminum compounds in industrial dusts in hygienic assessments of factory air in the aluminum industry. There are data indicating that aluminosis can only be caused by inhalation of aluminum metal dust and its oxide (hydroxide); nevertheless, a majority of reported investigations indicate that mixed dust of aluminum, silicon and iron is more dangerous in this respect. As before, limitation of the concentration of aluminum oxide (hydroxide) in the factory air remains the principal means for the prevention of aluminosis. There is to date no concurrence of opinion on the local effects of aluminum on skin and mucosae. Opinions concerning the effects of aluminum on wound and inflammatory processes are very controversial. Obviously, these effects of aluminum are determined not so much by the amount of metal used in the experiments and in practical treatments, or by the duration of their contact with a wound or skin, as by the purity of aluminum and the presence of old oxide film on its surface.

F-8441

Egorova, T. S.
SOME DATA CONCERNING THE EFFECT OF LOW ATMOSPHERIC CONCENTRATIONS OF SILICON DIOXIDE ON CHILD HEALTH. [Nekotorye dannye o vliyanii malykh kontsentratsii dvuokisi kremniya v atmosfernom vozdukhe na zdorov'e detskogo naseleniya.] Hygiene and Sanitation (English translation of: Gigiena Sanit.), 32(4-6):280-284, April-June 1967. 5 refs.
CFSTI: TT 67-51409/2

The determination of the level of atmospheric pollution by silica around a factory manufacturing ferrosiliçon alloys and its effect on child health was attempted. The atmospheric dust content was studied at the level of human respiration. Air samples were taken within a radius of 3 km by means of a truck aspirator on filters AFA-18. The samples (136) were tested for total dust concentration, concentration of free silica, and the percentage content of the latter in the dust. The effect of industrial discharges was studied by health statistical analysis of disease incidence in children, based on data of pediatric medical consultations, clinical examination of children and data on their physical development, and a special questionnaire for the population concerned with the effects on health and living conditions of the discharges. For comparability of data on the health of children residing in the area with polluted air and in the control district, studies were made of the living and dwelling conditions of the children and the economic means of their families. In the absence of special installations for the treatment of gases, these gases caused considerable atmospheric pollution. Concentrations of finely dispersed dust were 1.75 to 3.1 mg/m^3, considerably in excess of the maximum permissible concentration of "nontoxic dust." Some of the determinations revealed the presence of 30 to 66 percent of free silica which is the most toxic component of the discharges. Atmospheric pollution by the discharges has an unfavorable effect on the health of children, causing an increased overall morbidity and a higher incidence of respiratory infections and otorhinological disorders; moreover, the children's physical development lagged as compared to controls. Industrial discharges have an unfavorable effect on the sanitary and living conditions of the population. These findings proved the necessity for installations for the treatment of atmospheric discharges from furnaces producing ferrosilicon alloys and for a sanitary-protective zone separating the plants and the residential area.

F-8442

Kulinskaya, I. L.
EFFECT OF CHRONIC EXPOSURE TO LOW CONCENTRATIONS OF TOLUENE ON THE ACETYLCHOLINE SYSTEM IN THE BLOOD OF RABBITS. [Vliyanie khronicheskogo deistviya malykh kontsentratsii toluola na sistemy atsetilkholina v krovi krolikov.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):291-295, April-June 1967. 9 refs.
CFSTI: TT 67-51409/2

Alterations in the acetylcholine system were studied with a view to identifying early signs of poisoning with small doses of toluene. This system is a sensitive indicator of the functional state of the nervous system. Shifts occurring in this system on long-term exposure to benzene had been determined earlier. Chronic effects of low concentrations of industrial substances are accompanied by changes in the overall reactivity of the organism. Therefore this experiment combined the poisoning of experimental animals together with immunization with typhoid vaccine. Changes in acetylcholine concentration in blood appeared already at early stages of the unfavorable effect on the organism, before the appearance of changes in the activity of the AC-decomposing enzyme. Therefore, it is not expedient to limit studies of chronic poisoning to investigations of acetylcholinesterase activity, but parallel determinations of AC concentration should also be performed. Accumulation of AC in blood and increase in the ACE activity in the first and in the second periods of chronic poisoning point to an increased functional activity of the nervous system while the decrease in the mediator exchange indices in the third period points to possible inadequacy (humoral decompensation phase). The results confirmed that the process of prolonged poisoning initially intensified the functions of different systems but later these functions become weakened according to the depletion of the compensatory resources of the body.

F-8443

Khikmatullaeva, Sh. S.
MAXIMUM PERMISSIBLE CONCENTRATION OF THIOPHENE IN THE ATMOSPHERE. [Materialy k obosnovaniyu predel'no dopustimoi kontsentratsii tiofena v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):319-322, April-June 1967. 8 refs.
CFSTI: TT 67-51409/2

The single maximum permissible concentration of thiophene in the atmosphere was set at a level of 0.6 mg/m^3 by means of determining its threshold values of smell (2.1 mg/m^3), of ocular-light sensitivity and that of the bioelectric activity of the human cerebral cortex (0.8 mg/m^3). A study of the resorptive action of thiopene at concentrations of 20 and 3 mg/m^3 on albino rats revealed definite shifts in the chronaxy of muscle-antagonists, in the content of protein fractions, of sulfahydride groups, and that of syalic acids in the blood serum, in the leucocyte count and formula of the blood, in the level of coproporphyrins in the urine and that of ascorbic and pyro tartaric acids in the organ tissues. As thiophene at a concentration of 0.6 mg/m^3 proved to be ineffective, it is suggested that this concentration be set as the daily average maximum permissible concentration of the substance in the atmosphere. (Author's summary)

F-8444

Chizhikov, V. A.
PRODUCTION OF CERTAIN PATHOLOGICAL MANIFESTATIONS AS A CONDITIONED REFLEX INDUCED BY EXPOSURE TO LOW CONCENTRATIONS OF TOXIC SUBSTANCES. [Uslovnoreflektornoe vosproizvedenie nekotorykh simptomov patologicheskikh sostoyanii pri deistvii malykh kontsentratsii vrednykh veshchestv.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):323-328, April-June 1967. 5 refs.
CFSTI: TT 67-51409/2

An attempt was made to obtain a conditioned pathological reflex to olfactory irritation. Use was made of the individual capacity of certain albino rats to develop epileptic fits in reply to a sound stimulus. Sulfurous gas at concentrations of 1 to 3 mg/m^3 was used as a conditioned signal agent. This concentration with short-term separate action served as an indifferent stimulation for animals. A sound (bell) served as an unconditioned stimulus, provoking in animals of the two first groups epileptiform fits. After repeated simultaneous action of conditioned and unconditioned excitation, no typical epileptiform fit could be obtained in the separate action of sulfurous gas alone; it provoked only primary signs of an epileptic fit. Under these conditions the leucocyte count in the animal's blood increased significantly. The experimental findings obtained proved that gas concentrations, producing no toxic effect, when used in combination with other reflexes responsible for pathological processes, may finally produce these processes independently. (Author's summary)

F-8445

Roshchin, I. V.
TOXICOLOGY OF VANADIUM COMPOUNDS USED IN MODERN INDUSTRY. [Toksikologiya soedinenii vanadiya, primenyaemykh v sovremennoi promyshlennosti.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):345-352, April-June 1967. 14 refs.
CFSTI: TT 67-51409/2

On the basis of experimental and clinical observations, the clinical picture and the nature of the toxic action of vanadium compounds of various valency was analyzed. Special attention was paid to the fermentation mechanism of the toxic action and mainly the effect of vanadium on the metabolism of serotonin in protein and nucleoprotein. A study of the vanadium distribution in the body and its excretion from the body was undertaken: the substance was noted to affect the immunobiological resistance of the body and the allergic reactivity. Certain bichemical, physiological and morphological changes developed in the body in the course of the intoxication. Comparative toxicologic characteristics are presented of vanadium compounds used in different branches of industry: oxides, salts (ammonium and sodium vanadate, chlorides), refractory compounds (metals, alloys, carbide). On the basis of the data obtained, maximal permissible concentrations in the air of working premises are recommended. (Author's summary)

F-8669

Binek, Bedrich, Blanka Dohnalova, Sieglinde Przyborowski, and Werner Ullmann
USING THE SCINTILLATION SPECTROMETER FOR AEROSOLS IN RESEARCH AND INDUSTRY. STAUB (English translation), 27(9):1-7, Sept. 1967. 14 refs.
CFSTI: TT 67-51408/9

The scintillation spectrometer (SS) automatically counts aerosol particles down to magnitudes of 10^{-2} μ, differentiates them by particle sizes, and permits their quantitative and qualitative chemical analysis. The aerosol particles are individually introduced into a heating chamber. An appropriate temperature having been reached, the particle emits a light pulse. These pulses are evaluated by an optical-electronic device. Since only one particle is located in the heating chamber at any given moment, there is a clear correlation between the intensity of the light pulse and particle diameter. The SS has numerous possibilities of application, most of which deal with the measurement of particle concentrations and particle-size distributions. Other applications are: measuring the electrical charges of aerosols; investigating the behavior of aerosol systems; investigating aerosol measuring instruments; investigating aerosol filtration; investigating the kinetics filtration; investigating the separation of aerosols in the respiratory tract; investigating flow processes and qualitative and quantitative detection of trace substances.

F-8763

Kustov, V. V.
MEANS OF DETERMINING THE MAXIMUM ALLOWABLE CONCENTRATIONS OF TOXIC PRODUCTS OF NATURAL HUMAN METABOLISM. [Puti ustanovleniya predel'no dopustimykh kontsentratsiya toksicheskikh produktov yestestvennogo metabolizma cheloveka.] Obshchiye Voprosy Promyshlenoy Toksikologii, Moscow, 1967, p. 63-65. 1 ref. Translated from Russian. National Aeronautics and Space Administration, Washington, D. C., 358, 3p., Oct. 1967.

The effect of the 7 to 8 hour action of carbon monoxide, ammonia, and acetone on certain physiological and biochemical indices in man is proposed as the basis for determining the maximum allowable concentrations for human natural metabolic products. (Author's abstract)

F-8766

Shalamberidze, O. P.
REFLEX EFFECTS OF MIXTURES OF SULFUR AND NITROGEN DIOXIDES. [Reflektornoe deistvie smesi sernistogo gaza i dvuokisi azota.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):10-15, July-Sept. 1967. 7 refs.
CFSTI: TT 67-51409/3

The olfactory threshold for sulfur dioxide was found to lie at a level of 1.6 mg/m^3 for the largest group of the most sensitive subjects, and that of nitrogen dioxide at a level of 0.23 mg/m^3. The index of total concentration of an olfactorily perceptible mixture of SO_2 + NO_2 (expressed in fractions of the threshold concentrations) was found to be 1.02, indicating total summation of the effects of the substance investigated. The threshold of the effect of nitrogen dioxide on the functional state of the visual analyser determined by the dark adaptation method was found to be below the olfactory threshold of 0.14 mg/m^3, while the subliminal concentration was at a level of 0.087 mg/m^3. Consequently, the existing maximum permissible one-time concentration of nitrogen oxides (0.3 mg/m^3) should be lowered to 0.1 mg/m^3. When inhaled together, the effect of the two gases is a complete summation. The index of the total concentration of threshold mixtures was found to be 1, when expressed in fractions of the separate threshold concentrations. When sulfur and nitrogen dioxides are present together in the air their total one-time concentration, expressed as fractions of the maximum permissible concentrations for each of these gases separately should not exceed 1. The threshold for the reflex effect of sulfur and nitrogen dioxides differs according to whether the inhalation is nasal or oral, indicating that some part is played by the receptors in the human nasal cavity in determining the appearance of reflex changes on the inhalation of chemical substances. Concentrations of sulfur and nitrogen dioxides which are subliminal with respect to their reflex effects are ineffective in regard to human subjects, provided that the period of exposure does not exceed 25 min.

F-8767

Sadilova, M. S. and L. M. Petin
AN APPARATUS FOR THE EXPERIMENTAL EXPOSURE OF ANIMALS TO CONDENSATION AEROSOLS. [Eksperimental'naya ustanovka dlya zatravki zhivotnykh aerozolyami kondensatii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):70-74, July-Sept. 1967. 1 ref.
CFSTI: TT 67-51409/3

An apparatus is described in which the desired concentrations of sublimation aerosols can be maintained in a gas chamber. A system of automatic monitoring of the working state of the air blowers and the Silit furnace ensured that the animals were exposed to inhalation of the aerosols without any breakdown over prolonged periods.

F-8769

Mel'nichenko, R. K., P. A. Nagornyi, N. Z. Slinchenko, I. K. Smirnova, A. M. Shevchenko, and I. I. Sheleketina
POTASSIUM CARBONATE INHALATION FOR THE PREVENTION OF PNEUMOCONIOSIS. [O vozmozhnosti primeneniya ingalyatsii uglekislogo kaliya dlya profilaktiki pneumokoniozov.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):119-123, July-Sept. 1967. 8 refs.
CFSTI: TT 67-51409/3

The concentrations of potassium carbonate which were effective when the dust in the air was fairly high were determined and the possibility that such concentrations were harmless to the body on prolonged inhalation was investigated. Albino rats were used for the experiments. The first series of animals was exposed to quartz dust for 4 hours over a period of nine months. The remaining series were also exposed to dust but the second inhaled a 0.5 percent solution of potassium carbonate, the third series a 3 percent solution and the fourth series a 7 percent solution of potassium carbonate. The dust content in the chamber varied from 150 to 250 mg/m^3. The inhalation of potassium carbonate before and after exposure to dust retarded the development of silicotic changes in the lungs of experimental animals. The inhalation of 1 and 3 percent solutions of K_2CO_3 for 4 months did not give rise to any pathological changes in the experimental animals. It is suggested that the inhalation of a 3 percent solution of K_2CO_3 be investigated under industrial conditions.

F-8771

Galibin, G. P., V. I. Fedorova, and N. M. Karamzina
THE MAXIMUM PERMISSIBLE CONCENTRATION OF BENZYL CYANIDE IN FACTORY AIR. [K obosnovaniyu predel'no dopustimoi kontsentratsii tsianistogo benzila v vozdukhe rabochikh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):176-181, July-Sept. 1967.
CFSTI: TT 67-51409/3

The toxicity of benzil cyanide was studied in experiments on rats, mice, and rabbits on its injection into the stomach, by inhalation of its vapors, and by its application to the skin and the ocular mucous membrane. The lethal doses (LD_{84}, LD_{50}, LD_{16}) for rats and mice were determined on its single introduction and on inhalation of its vapors for 2 hours. The threshold value and the affecting concentration of benzil cyanide vapors were determined in case of its single, repeated and chronic action. The poisoning through the skin and chronic intoxication were found to be possible under the conditions prevailing in industry. Data of clinical, biochemical and pathological examinations are presented. The maximum permissible concentration of benzil cyanide vapor in the air of working premises is suggested at a level of 0.0008 mg/l. (Authors' summary)

F-8772

Mokronosova, K. A., B. A. Katsnel'son, L. G. Babushkina, and L. N. El'nichnykh
EFFECT OF PHYSICAL WORK ON THE DEVELOPMENT OF OF SILICOSIS AFTER THE CESSATION OF EXPOSURE TO DUST. [O vliyanii fizicheskoi nagruzki na razvitie silikoza posle prekrashcheniya postupleniya pyli v legkie.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):181-187, July-Sept. 1967. 9 refs.
CFSTI: TT 67-51409/3

Observation of a large number of persons, who became ill with silicosis under similar working conditions in the copper mines and who were later employed in various jobs outside the mines, proved that the work requiring considerable physical strain contributed to further development of the disease. An experiment carried out on rats given a standard dose of quartz dust showed the daily physical strain to promote the development of the silicosis fibrosis, judging both by the histological data and the weight of lungs and the contents of lipids and oxyproline in them. (Authors' summary)

F-8774

Mamatsashvili, M. I.
DETERMINATION OF THE REFLEX EFFECT OF SULFUR DIOXIDE AND CARBON MONOXIDE BY ADAPTOMETRY AND BY TESTS OF COLOR VISION. [Opredelenie reflektornogo deistviya sernistogo gaza i okisi ugleroda metodom adaptometrii i issledovaniya tsvetovogo zreniya.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):226-230, July-Sept. 1967. 4 refs.
CFSTI: TT 67-51409/3

The reflex effect was studied by testing the variations in ocular sensitivity to light and color vision. Adaptometry is a very sensitive method of determining the threshold reflex effect of various substances on the respiratory receptors and is widely used by Soviet hygienists for determining the maximum permissible concentration of atmospheric pollutants. The dark adaptation curve was determined with an ADM adaptometer, and color vision was determined with Nagel's anomaloscope, on three human subjects aged 20 to 40. The inhalation of 6 mg/m^3 CO (the maximum one-time permissible concentration) caused a statistically significant lowering of the color discrimination threshold in two subjects and an increase in one subject (female) for all three color combinations. The results indicate that carbon monoxide weakens the reaction to both color tests. No statistically significant changes in ocular sensitivity to light in dark adaptation tests were found in any of the three subjects on the inhalation of 0.5 mg/m^3 SO_2 (the maximum one-time permissible concentration). The inhalation of 0.5 mg/m^3 SO_2 also caused no change in color vision in the subjects. The inhalation of a CO + SO_2 mixture at the level of the current maximum permissible one-time concentration resulted in statistically significant changes in the ocular sensitivity to light in all three subjects. In 2 subjects there was a decrease from the 20th minute and in the third subject an increase from the 15th minute. The changes in the color vision threshold on inhalation of the mixture were statistically significant in all three subjects. The findings raise the question of whether the maximum permissible one-time concentration of carbon monoxide should not be lowered to 3 mg/m^3. Determination of the color-vision threshold proved to be a sensitive and practicable method of studying the reflex effect of substances, which can therefore be recommended as a test for hygienic standards. The exposure time may be usefully prolonged to 30 minutes in studies of substances with a weak reflex effect.

F-8781

Rasskazova, T. V.
THE EFFECT OF HYDROCARBON VAPORS ON THE CONTENT AND VIRULENCE OF BACTERIA IN THE NASAL MUCOSA. [Vliyanie parov uglevodorodov na kontsentratsiyu i virulent nost' bakterii v slizistol obolochke nosa.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):286-288, July-Sept. 1967. 4 refs.
CFSTI: TT 67-51409/3

The effect of industrial factors on immunobiological reactivity and on the behavior of the mucosal microflora was studied. The test group consisted of 86 women workers, aged 18-54, who had been employed at the footwear factory for 3 years or more; the control group consisted of 63 women workers from a cutting shop and students from the institute, of approximately the same age, none of whom had been exposed to the hydrocarbons. It was found that prolonged exposure to even small concentrations of the mixture of the hydrocarbons inhibited immunobiological reactivity. The content and virulence of the bacteria inhabiting the nasal mucosa were studied in 116 workers from the footwear factory (test group) and in 128 persons not exposed to the investigated substance (the control group). The concentration of bacteria on the nasal mucosa was determined by washing out the nasal cavity with 10 ml of warm sterile physiological solution, by means of an irrigation device consisting of an olive-shaped bulb connected by a rubber tube with a cylindrical funnel. The concentration of bacteria in the nasal mucosa was found to be higher in the test group. Thus, exposure to an industrial health hazard may increase the concentration of bacteria on the nasal mucosa and somewhat increase their virulence. This phenomenon probably plays a definite part in the mechanism of upper respiratory tract infections.

F-8782

Ubaidullaev, R.
COMBINED EFFECT OF LOW CONCENTRATIONS OF FURFURAL, METHANOL AND HYDROLYSIS ETHANOL UNDER EXPERIMENTAL CONDITIONS. [Kombinirovannoe deistvie malykh kontsentratsii furfurola, methanola a gidroliznogo etanola v usloviyakh eksperimenta.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):313-319, July-Sept. 1967. 8 refs.
CFSTI: TT 67-51409/3

In order to determine the maximum single time and daily average maximum permissible concentration of a mixture of furfural, methanol and hydrolysis ethanol in the atmosphere, the threshold value of smell of the mixture, its effect on the light sensitivity of eyes, and the electric activity of the human cerebrum were investigated. Under conditions of a chronic 24-hour poisoning of albino rats for a period of 90 days, a study of the muscles-antagonists chronaxy, cholinesterase activity, coproporphyrine excretion in the urine, total amount of proteins and that of protein fraction in the blood serum was undertaken. On the basis of these data it is suggested that the total maximal single time and the daily hydrolysis ethanol in the atmosphere not exceed 1.0 part of the maximum permissible concentration of each isolated substance (the sum of their concentrations expressed in the fraction of their separate maximum one-time permissible concentrations).

F-8784

Kryzhanovskaya, M. V., G. I. Vinogradov, and I. M. Karandakova
ANAPHYLAXIS WITH DESENSITIZATION FOR INVESTIGATION OF ALLERGENIC PROPERTIES OF ATMOSPHERIC POLLUTANTS. [Anafilaksiya s desensibilizatsiei kak metod vyyavleniya allergennykh svoistv atmosfernykh zagryaznenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):383-388, July-Sept. 1967. 6 refs.
CFSTI: TT 67-51409/3

Experiments aimed at sensitizing guinea pigs by parallel administration of the chemical and the protein without any preliminary combination of the two were conducted. Then it was proposed to desensitize completely the guinea pigs with respect to the protein prior to the administration of the reacting dose. It was proposed to use the chemical alone as the reacting substance, in which case appearance of anaphylactic shock would prove the allergenic activity of the substance. Anaphylactic reaction with desensitization should be regarded as a demonstrative method providing an objective proof of the allergenic activity of low concentrations of chemical substances. Chemical compounds discharged into the atmosphere by industrial enterprises may sensitize the human organism without being chemically or mechanically combined with protein.

F-8785

Andreeshcheva, N. G. and V. A. Gofmekler
A MODIFICATION IN THE METHOD FOR INVESTIGATING THE OCULAR SENSITIVITY TO LIGHT. [K voprosu o nekotorom izmenenii metodiki issledovaniya svetovoi chuvstvitel'nosti glaz.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):388-391, July-Sept. 1967. 8 refs.
CFSTI: TT 67-51409/3

An attempt was made by using different variants to utilize the accelerated adaptation and the increased ocular sensitivity to light for reducing the time involved in studies of the latter. By measuring the ocular sensitivity to light after 1 to 2 minutes instead of the generally adopted interval of 5 minutes, a more complete observation of the dynamics of the effect of the investigated substances on the human body was sought. All of the four variants were used for determinations of the threshold for the variation of the ocular sensitivity to light on inhalation by three subjects of subsensory concentrations of m-nitrochlorobenzene (variants I and II) and 3,4-dichloroaniline (variants I, II, and IV); m-nitrochlorobenzene concentrations of 0.012 and 0.008 mg/m^3 and 3,4-dichloroaniline concentrations of 0.025 and 0.020 mg/m^3 were investigated. The experimental results were analyzed statistically by the range method (light sensitivity in relative units and in percentages) for all measurement times; all the variants were found to be equivalent with respect to sensitivity. The threshold concentrations affecting the ocular sensitivity to light were found to be 0.012 mg/m^3 m-nitrochlorobenzene and 0.025 mg/m^3 3,4-dichloroaniline. The investigations of ocular sensitivity to light by the method of dark visual adaptation with preliminary "illumination" of both eyes with red light or of one eye with red or white light make possible a reduction of the investigation period to 20 min. instead of the 40 min. currently used in practical hygienic norming of atmospheric pollutants with preliminary "illumination" of both eyes with white light. Sensitivity of the method is not affected by this saving in time.

F-8787

Faustov, A. S.
STANDARDIZATION OF TOLUENE VALUES IN FACTORY AIR. [K normirovaniyu toluola v vozdukhe rabochikh pomeshchenii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):448-451, July-Sept. 1967. 1 ref.
CFSTI: TT 67-51409/3

The effect of prolonged exposure to low toluene concentrations was determined on 12 rabbits and 48 albino rats that were divided into three equal groups. The first group was poisoned with a toluene concentration of 0.05 mg/l air, those in the second group with a concentration of 0.05 mg/l, while the third group served as the control. The animals were exposed to toluene for 4 hours daily over a 6-month period. This communication is mainly concerned with the experimental material obtained with a toluene concentration of 0.05 mg/l because this is the current maximum permissible concentration for factories. Chronic toluene poisoning led to the development of alterations in the chronaxial relationship between antagonistic muscles. Alterations in the activity of CNS were likewise revealed by a decrease in the cholinesterase activity although it was not statistically significant for a toluene concentration of 0.05 mg/l. Hematologic tests suggest that the earliest changes in the morphological composition of blood are leukocytosis and reticulocytosis. No other changes in the morphological composition of blood were discovered in animals poisoned with a toluene concentration of 0.05 mg/l. More pronounced disturbances were discovered in the blood protein composition. Prolonged toluene poisoning was found to inhibit the general and specific immunological reactivity. This was confirmed by the decrease in the phagocytic activity of leukocytes and the agglutination titer of the blood serum of the experimental animals in the 4th and 6th month of poisoning. Pathohistological alterations were found in animals of both experimental groups, but they were more pronounced in the animals treated with a toluene concentration of 0.5 mg/l. These include bronchopneumonia and hemorrhagic pneumonia, granular and fatty hepatic degeneration and slight changes in the kidneys, spleen, and other internal organs. The experimental data serve as a basis for the revision of the current maximum permissible concentration of toluene in factory air. Taking the toluene concentration of 0.05 mg/l as the threshold concentration for chronic poisoning, the safety factor was calculated. The toluene concentration in factory air is equal to 1/5 of the threshold concentration.

F-9396

Kosmider, S., S. Zajaczkowski, and E. Rogowska
ACTIVITY OF SERUM CHOLINESTERASE IN EXPERIMENTAL POISONING WITH METALLIC MERCURY. Patol. Polska, 17(1), 1966. 15 refs. Translated from Polish. Polish Med. J., 5(5):1044-1048, Oct. 1966.

Serum cholinesterase activity was studied in a group of 25 rabbits exposed for 30 days to 1.5 hr. daily to 10.6 mg/m^3 mercury vapor. Increased diuresis and salivation were observed in all rabbits. Daily urinary excretion of Hg increased, from 11-35 gamma in the first week of exposure to 117-125 gamma. Serum cholinesterase activity dropped significantly after the 30-day exposure. Studies of human serum cholinesterase *in vitro* also indicate enzymatic activity is reduced by the presence of Hg ions. A drop in serum cholinesterase activity could be of diagnostic value in the examination of persons exposed to mercury.

F-9397

Kosmider, Stanislaw and Zdzislaw Dabrowski
CATALASE ACTIVITY OF THE RED BLOOD CELLS, BRAIN, AND LIVER IN EXPERIMENTAL POISONING WITH METALLIC MERCURY. Arch. Immunol. Therap. Exptl. (Warsaw), 14(1):74-78, 1966. 18 refs.

Catalase activity of erythrocytes, liver, and brain was studied in 19 rabbits exposed for 30 days for 1.5 hours daily to 10.6 mg/m^3 mercury vapor. Salivation and apathy were observed. Urinary excretion of Hg rose from 11 to 35 gamma in the following weeks. Controls were normal. Erythrocyte catalase activity increased significantly after 30 days exposure, but increased to lesser degrees in the liver and cerebral tissues. Increased enzyme activity may be an expression of a cellular defense mechanism to the effect of the Hg ions.

G-4242

Yagovoi, P. N., V. I. Shendevitskii, and N. N. Ivchik
TRAPPING OF RADIOACTIVE DUST BY GREEN PLANTATIONS. [K voprosu o zaderzhke radioaktivnoi pyli zelenymi nasazhdeniyami.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):106-110, July-Sept. 1966. 10 refs.

It has been established that smoke dust adsorbs radioactive substances from the air. An experiment was performed to test the hypothesis that the radioactivity of plants should be higher in areas polluted with smoke discharges due to the capacity of the foliage to trap dust. The leaves of certain tree and shrub species were sampled in Leningrad and in a park in Pavlovsk. In Leningrad, the samples were taken at varying distances from a coal burning power plant. It was found that the park leaves contained less radioactivity than the Leningrad leaves. However, it was also demonstrated that the leaves of some species had an increasing amount of radioactivity as distance from the power plant increased, while in other species the reverse occurred. Results indicated that this was due to the variation in the size of the dust particles which the different species were capable of trapping.

G-4816

Schneider, W.
CAN FLUORINE DAMAGE TO PLANTS BE ESTABLISHED BY ANALYZING THEIR ASH? STAUB (English translation), 26(12):29-31, Dec. 1966.

The following precepts were obtained regarding the relationship of fluorine plant damage and the correlation to the analysis of their ash: No conclusions can be drawn from the established fluorine content of the plant ash in regard to the state of the plants, since the fluorine content of healthy and atrophied leaves is frequently identical. The content of total fluoride is not a specific, characteristic magnitude of the vegetation, but varies with location. It is, therefore, not possible to establish reference magnitudes for use as normal values. Data on fluorine content are dependent upon the dry mass of the material being analyzed. The investigation revealed the following: Damage to plants due to the effect of fluorine compounds cannot be proved by analysis of plant ash. The fluorine content determined does not give any information as to the condition and development of the plant. The fluorine content is independent of the age of the leaves.

G-7135

Abramashvili, G. G.
THE EFFECT OF ATMOSPHERIC AIR POLLUTION ON CONIFEROUS PLANTINGS. Gigiena i Sanit., No. 4, p. 67-69, 1957. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 75-78, Jan. 1960.
CFSTI: TT 21049

In recent years there has been noticed a general trend to use coniferous trees in the landscaping of gardens, parks, boulevards, and residence grounds. This trend gained impetus due to the fact that in the northern part of the U. S. S. R. leafy trees remain bare during 6 to 7 months of the year, whereas the evergreen coniferous tree varieties act as purifiers of atmospheric air from dust and gaseous pollution. It was demonstrated that coniferous tree varieties possess the property of first adsorbing and then absorbing via the stoma and leaf openings such city street gases as SO_2 and SO_3 and accumulating them to varying degrees. Analysis of coniferous needles collected at different points in Moscow showed that the sulfate content which spruce tree needles can tolerate without any notable ill effect ranged between 0.5 - 0.85 percent. The results of these studies indicated that coniferous species, especially the prickly spruce, are useful city landscape decorating agents and can play an important part in the sanitary improvement of urban environment.

G-8170

Gusev, M. I.
DUST-RETAINING PROPERTIES OF LEAVES OF SOME TREE SPECIES. Gigiena i Sanit., No. 6, p. 17-19, 1952. Translated from Russian by B. S. Levine, U. S. S. R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 243-245, May 1960.
CFSTI: TT 60-21475

A study was made in Tashkent, Russia of the dust-retaining power of leaves of several tree species. Investigations were made in a park where these tree species were growing in close proximity, exposed to the effects of dust from the main city street and from the highway passing through the park. Observations on the dust-retaining power of leaves were made mostly during the summer and fall months. The dust-retaining power of leaves of different tree species varied with the dust concentration in the air. In the summer and fall when rains are scarce a steady accumulation of dust was observed on the surface of the leaves.

H-5229

Gleizer, M. D.
REINFORCING THE INSULATION OF ELECTRIC POWER LINES IN AREAS OF INTENSE ATMOSPHERIC POLLUTION. Elektr. St., 32(10):61-65, Oct. 1961. Translated from Russian. Office of Technical Services, Dept. of Commerce, Washington, D. C., 8 p., 1962.
CFSTI: TT 62-25932

In areas of intensive atmospheric pollution by chemical and other deposits, the use of composite insulator assemblies, in which some of the insulators are arranged vertically and others horizontally, is recommended. The flashover characteristics of these insulator assemblies, in clean conditions, are approximately the same as those of normal insulator strings containing the same number of insulators. Their insulating characteristics, when contaminated with atmospheric deposits, are considerably better than those of normal insulator strings. Composite insulator assemblies are fouled less readily than normal suspension strings, and the insulation loads are distributed over them more uniformly.

H-6528

Roikh, I. L.
EMISSION OF PHOTOGRAPHICALLY ACTIVE PARTICLES IN THE ATMOSPHERIC CORROSION OF METALS. Dokl. Akad. Nauk SSR. 63(2):119-122, 1948. 4 refs. Translated from Russian. Defense Scientific Information Service, DRB, Canada, p. 1-5, Feb. 24, 1953.
CFSTI: AD 610893

The results are presented of an experimental research on the kinetics of the emission of photographically active particles in the corrosion of magnesium, aluminum and zinc. These particles are emitted only after the removal of the protective film of oxide. The kinetic experiments consisted in moving the metal samples to successive positions underneath the photographic plate, to make a series of exposures across the plate. Exposure times were 2, 4 and 24 hours. The experiments were carried out with fresh metal filings, which, because of the larger active surface, give a strong photographic effect. The optical density of the images was determined by means of a photometer (set up in the laboratory) with a selenium photo-element. Curves of optical density against time are presented for aluminum, magnesium, and zinc. The curve for aluminum is compared with a curve of the reciprocal of weight increase against time which is based on independent experimental data. It is concluded that between the optical density due to any given quantity of photographically active particles emitted by a metal, and on the other hand the thickness of the oxide film, there is a definite relationship. Thus the kinetic curve of emission of the photographically active particles will also serve to characterize the progress of atmospheric corrosion.

H-6529

Roikh, I. L. and F. Ye. Mazayev
TEMPERATURE DEPENDENCE OF THE EMISSION OF PHOTOGRAPHICALLY ACTIVE PARTICLES IN THE ATMOSPHERIC CORROSION OF MAGNESIUM AND ZINC. Dokl. Akad. Nauk SSR, 72(2):335-338, 1950. Translated from Russian. Defense Scientific Information Service, DRB, Canada, p. 6-11, Feb. 24, 1953.
CFSTI: AD 610893

Experiments were made on plates of magnesium and zinc. The zinc plates were cut out of a single sheet, produced from a melt of the commercially available chemically pure granulated metal. The magnesium samples had the following composition: Mg 99.825 percent, Si 0.014 percent, Fe 0.040 percent, Al 0.013 percent. The polished flat plate was heated for five minutes, cleaned, placed on a mica diaphragm (0.06 mm thick) which was laid directly on the photographic emulsion for 10 minutes. The measurements were made in the temperature interval -13 to + 100C. The temperature variation in any exposure did not exceed ± 2C. With due allowance for the effect of temperature on the sensitivity of the emulsion layer, the linear relation between the blackening of the photographic plate and the reciprocal of the absolute temperature of the metals is graphed. In another experiment, the photographic plate was placed underneath the metal sample, and both were kept at constant temperatures for about 10 minutes, the metal cleaned, and the exposure taken. For each different temperature, a different area of the photographic plate was moved under the test metal. The blackening thus produced was then measured photometrically. If the number of particles falling upon the photographic plate is always a certain definite fraction of the particles emitted by the metal, then the number of particles issuing from the metal in the process of atmospheric corrosion is an exponential function of the temperature.

I-6038

Sherwood, P. W.
HOW ATMOSPHERIC CONDITIONS CAN CORRODE REFINERY EQUIPMENT. Translated from German. Erdöl und Kohle-Erdgas-Petrochemie, 19(4):289-290, April 1966.

Atmospheric corrosion of refinery equipment from the effects of humidity, dusts and electrolytes is reviewed. Effect of humidity: Although water vapor contributes to the mechanism of atmospheric corrosion, the principal offender is water which precipitates in liquid form from saturated or near-saturated air. An oxidation-reduction potential may be built up between two surfaces which promotes corrosion. Electrolytes dissolved in the water will increase corrosive action. Enclosed storage and humidity control are two approaches which can be used to counteract some of these situations. Effects of dust: These are probably not significant unless the dust consists of a salt or other kind of electrolyte. Effects of oxidants and electrolytes: Oxidants cause serious corrosion only in the presence of liquid water. Acidic materials are seen to be the worst corrosive agents in the atmosphere. Salts are strong electrolytes and in the presence of liquid water they will contribute to rusting of materials. Alkalies are not considered a serious problem in atmospheric corrosion; strong alkalies deposited in the presence of liquid water can cause deterioration of aluminum or zinc.

J-4070

Imasheva, N. B.
EXPERIMENTAL BASIS FOR THE DETERMINATION OF ALLOWABLE ACETOPHENONE LIMITS IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(2):3-8, Feb. 1963. 9 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 28-34, 1966.
CFSTI: TT 66-61429

Acetophenone is used in chemopharmaceutical, aniline dye and organic synthesis industries. For this reason such industries constitute potential sources of atmospheric air pollution with acetophenone. The basic sources of air pollution are production of acetone and of phenol by the cumene method of which acetophenone is a side product. Experiments for the determination of acetophenone in the atmospheric air were conducted by the method of V. A. Khrustaleva which was based on the reaction between acetophenone and m-dinitrobenzene which resulted in the production of a rose-colored substance, the intensity of which was proportional to the concentration of acetophenone; the test color is compared with a freshly prepared color scale. Maximal single dose of acetophenone in atmospheric air was determined by the threshold of acetophenone odor perception method, and by the effect of low acetophenone concentration on eye sensitivity to light, and by the electroencephalographic method. The threshold of acetophenone threshold odor perception for most sensitive persons was determined as 0.01 mg/m^3, and the maximal nonperceptible concentration (subthreshold concentration) was determined as 0.01 mg/m^3. The threshold of acetophenone reflex activity on eye sensitivity to light was determined as 0.01 mg/m^3. Inhalation of 0.007 mg/m^3 acetone-air mixture for a short time elicited changes in the electrical brain activity but was inactive at 0.003 mg/m^3 concentration. Chronic 24-hour inhalation of 0.07 mg/m^3 of acetophenone under chronic experimental conditions elicited no detected changes in the above mentioned indexes. It is recommended that 0.003 mg/m^3 be adopted as the maximal single and 24-hour concentration limit for acetophenone in atmospheric air.

J-4077

Kushakovskii, L. N. and R. I. Teplitskaya
POLLUTION OF HIGH SCHOOL PHYSICS DEPARTMENTS WITH METALLIC MERCURY. Gigiena i Sanit., 28(3):76-79, March 1963. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 67-70, 1966.
CFSTI: TT 66-61429

Metallic mercury is used in high-school physics classes extensively in studying the Boyle-Mariotte and Gay-Lussac laws, the Torricelli experiment, etc. In this connection air pollution in high school physics departments with metallic mercury was investigated in 7 schools located in different sections of Dniepropetrovsk. Results revealed considerable mercury content in the air of such locations. Samples of air were collected at work desks, teachers' desks, in the middle of classrooms and the the preparation rooms where mercury was distributed into tubes for classroom exercises. The air samples were collected at ground and breathing levels. Similarly, mercury was determined in wash water from surfaces of school furniture, floors and equipment. Mercury content in samples of air and wash water was determined by the Polezhaev method. The data show that only 25 percent of the investigated samples of air from physics departments contained no mercury, while in 23 percent of the samples the concentration of mercury exceeded the maximum permissible for air of industrial establishments (0.01 mg/m^3). No mercury was found in only 6 percent of air samples collected in the preparation rooms, while in 35 percent of all samples the mercury concentration exceeded the permissible maximum. Thus, the greatest pollution of air by mercury vapor was found in the preparation rooms, in which mercury has been distributed generally in open tubes and carried in and out without regard for specified hygienic safety requirements. This intense mercury pollution of the surroundings was the cause of occupational mercury poisoning of teacher and laboratory technician working in the high school physics department. Students in high school physics departments generally ranged between the ages of 13-17 years. For this reason it is more apropos, in fact, more rational to use the 0.0003 mg/m^3 M.A.C. adopted officially for mercury in atmospheric air and not the 0.01 mg/m^3 M.A.C. officially adopted for mercury vapor in the air of working premises.

J-4078

Tkachev, P. G.
EXPERIMENTAL DATA AS A BASIS FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE ANILINE CONCENTRATION IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(4):3-11, April 1963. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 71-80, 1966.
CFSTI: TT 66-61429

Aniline is widely used in many industries as the raw product from which aniline dyes are prepared for use in the textile and rubber industries and in the production of intermediates for the manufacture of medicinal products. The minimal odor perceptive aniline concentration for most sensitive persons was 0.37 mg/m^3, and the maximal nonperceptible concentration by odor was 0.34 mg/m^3. The concentration of aniline vapor threshold reflex effect on the brain cortex adaptation process to the rhythm of light flashes, as obtained by the method of functional electroencephalography, was 0.07 mg/m^3. It was previously shown that 0.05 mg/m^3 of aniline vapor elicited no changes in the animal organism; accordingly, it is recommended that 0.05 mg/m^3 be adopted as the maximal single permissible aniline vapor concentration in the atmospheric air. Results of the investigation showed that 3.0 and 0.3 mg/m^3 under similar conditions was entirely inactive. It is recommended that 0.03 mg/m^3 of aniline vapor in the atmospheric air be adopted as the maximal of 24 hour average concentration. Observations were made on the ground of and general vicinity surrounding the Novomoskovsk Phenol Plant, where aniline was used for the production of neozone D (phenylnaphthylamine) which this plant used at the rate of 6.5 - 7.0 tons per day. At 750 m from the source of aniline discharge 3 of 35 air samples contained aniline vapor in concentrations exceeding the recommended maximal single dose. The department which produced neozone D should be surrounded by a sanitary clearance zone not less than 1000 m wide; this recommendation does not take into account other possible harmful atmospheric air discharges.

J-4087

Chizhikov, V. A.
EXPERIMENTAL DATA AS A BASIS FOR THE DETERMINATION OF MAXIMAL PERMISSIBLE TOLUYLENE DIISOCYANATE CONCENTRATION IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(6):8-15, June 1963. 15 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12,

p. 133-140, 1966.
CFSTI: TT 66-61429

The concentration of toluylene diisocyanate threshold odor perception for most sensitive persons was experimentally established as 0.2 mg/m^3 and the maximal odor nonperceptible concentration was established at 0.15 mg/m^3. The concentration of toluylene diisocyanate threshold effect on electric brain activity was established at 0.1 mg/m^3, while 0.05 mg/m^3 concentration elicited no changes in the electric brain activity. The maximal single permissible toluylene diisocyanate concentration in atmospheric air should be set at 0.05 mg/m^3. Exposure of white rats to the inhalation of air containing 2.0 or 0.2 mg/m^3 of toluylene diisocyanate 24 hours daily for 84 days caused the animals to lose weight, brought about increased cholinesterase activity, changed muscle antagonists motor chronoxy, and disturbed the protein fraction ratios, and the process of porphyrin metabolism. In 0.02 mg/m^3 concentration, toluylene diisocyanate had no observable unfavorable effects on the organism of the exposed experimental rats. Based on the results of the present investigation, it is recommended that 0.02 mg/m^3 be accepted as the maximal average 24 hour toluylene diisocyanate concentration in atmospheric air.

J-4091

Gabinova, Zh. L., A. A. Vasil'eva, N. Kh. Sklyarskaya and M. D. Manita
EXPERIMENTAL STUDY OF ATMOSPHERIC AIR POLLUTION WITH 3, 4-BENZPYRENE IN INDUSTRIAL SECTIONS. Gigiena i Sanit., 28(6):65-69, June 1963. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 157-161, 1966.
CFSTI: TT 66-61429

The purpose was to obtain more complete and up-to-date information on the state of Moscow atmospheric air pollution with 3, 4-benzpyrene, on the basis of which rational sanitation means could be developed for the protection of atmospheric air against pollution with 3, 4-benzpyrene. The first investigation was centered around industrial enterprises which had been only slightly surveyed with regard to the presence of 3, 4-benzpyrene in the air and which, by the nature of their processing and production, lent themselves to the introduction of appropriate sanitization measures. 3, 4-benzpyrene determinations were made by fluorescent spectral method in the following order: in the primary raw material, in the intermediate and final products, in dust settled from the atmospheric air, and in dust collected by aspiration. Analyses were conducted in the physico-chemical laboratory of the Moscow Sanitary Epidemiological Station. It has been established that some raw materials, intermediate and final products used or manufactured by the investigated industrial plant contained detectable quantities of 3, 4-benzpyrene; samples of settled dust collected in the proximity of the investigated plants also contained detectable quantities of 3, 4-benzpyrene. Samples of aspirated atmospheric air collected on the electrode plant grounds during August-November of 1961, contained 3, 4-benzpyrene in 0.4-2.33 gamma per 100 m^3 of air. On the basis of this orientation investigation and sanitary-hygienic examinations, certain sanitization and air pollution protection means have been recommended and instituted in the investigated plants.

J-4100

Kvryndin, G. M., G. B. Orlovskaya and I. G. Dinkevich
EXPERIMENTAL HYGIENIC EVALUATION OF COMBUSTION PRODUCTS DISCHARGED INTO THE ATMOSPHERIC AIR BY THE SMELTING DEPARTMENT OF A METALLURGICAL PLANT. Gigiena i Sanit., 28(8):58-59, Aug. 1963. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 200-201, 1966.
CFSTI: TT 66-61429

The smelting department of a plant located in a residential block has one smelting furnace which burns 7 tons of fuel and produces 20 tons of pig iron per day. The hygienic investigation included a sanitary inspection of the territory over which the discharged smoke extended, and laboratory examinations of atmospheric air samples collected at given intervals. Air samples had been collected beginning with the month of May and ending with the month of December, a period during which the north-western and north-eastern winds prevailed in the vicinity. Air samples were tested for dust, soot and sulfur dioxide. Samples were collected in yards bordering on the plant grounds at the time the smoke plume spread over the yard at a distance of 12-30 m from the pollution origin. Sample collection was made by the aspiration method. Data showed that maximal single soot concentration was 2.8 times as high as the maximal permissible concentration in atmospheric air at a distance of 12-30; the dust concentration at 12-30 was 18 times as high at its maximal permissible concentration. Minimal single dust concentration at 12-20 m was 3.2 times as great, and at 22-30 m distance 5.2 times as great as the maximal permissible concentration in atmospheric air. The discharged smoke contained predominately fractions exceeding 10 microns in diameter.

J-4101

Zykova, A. S., E. L. Telushkina, G. P. Efremova and V. P. Rublevskii
RADIOACTIVITY LEVEL OF MOSCOW AMBIENT ATMOSPHERIC AIR IN 1957-1961. Gigiena i Sanit., 28(9): 5-11, Sept. 1963. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, 204-210, 1966.
CFSTI: TT 66-61429

The present investigation extended over 6 years and yielded data which illuminated the course of changes in the levels of Moscow atmospheric air radioactivity. Highest level of radio activity was recorded during 1957-1959 in the first 6 months of 1959 and at the end of 1961. Results showed that the radioactive substance concentrations in the air in the fall of 1958 retained their high levels after the resumption of nuclear weapon tests in the fall of 1958 for 6-7 months. This was followed by a substantial fall in the radioactivity level, reaching a minimum at the end of 6 months. Average monthly radioactive substance concentrations in the atmospheric air ranged between $1_x 10^{-16}$ and $1_x 10^{-14}$ curie/li during the period of observation. Results of radiochemical analyses showed that 0.73 microcurie of strontium-90, 1.24 microcurie of cesium-137 fell per 1 km^2 of ground surface in 1960; 1.68 microcurie of strontium-90 and 1.93 microcurie of cesium-137 fell per 1 km^2 of ground in 1961. Results of the present investigation point to the occurrence of spring and fall maxima of radioactive substance fallout from the atmospheric air. A degree of correlation appeared to exist between the amount of radioactive fallout and atmospheric precipitation. Results of atmospheric air investigation made by the method of snow samples, open pan collection procedure, and aspiration method were in good agreement and reflected the course followed by atmospheric air pollution with radioactive substances in Moscow environs during the 1957-1961 period.

J-4106

Cooperman, E. F.
MAXIMAL PERMISSIBLE CONCENTRATION OF HEXAVALENT CHROMIUM IN ATMOSPHERIC AIR. Gigiena i Sanit., 28(11):9-16, Nov. 1963. 11 refs. Translated from Russian by B.S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 249-256, 1966.
CFSTI: TT 66-61429

A concentration of 2.5 microns/m^3 of hexavalent chromium in the air represented its threshold of irritation action; the same 2.5 micron/m^3 concentration represented the threshold of reflex chromium aerosol effect on the functional state of the cerebral cortex, as determined by the adaptometric method for persons of highest perception sensitivity. 1.5 microns/m^3 of chromium, as determined by the above mentioned procedure, produced no unfavorable effects on the organism, and should be regarded as the nonactive or subthreshold concentration Hexavalent chromium in 30 microns/m^3 concentration chronically inhaled for a period of 90 days, elicited in the experimental animals, changes in their motor chronaxies, in the carbonic anhydrase activity, and in the morphologic component of the blood. Some definite histologic changes were noted in the tissue of internal organs. Under similar chronic conditions, inhalation of air containing 1.5 microns/m^3 of the hexavalent chromium produced no statistically significant changes. The concentration of 1.5 microns/m^3 computed as CrO_3 can be adopted as the maximal single, and also as the 24 hour, hexavalent chromium concentration in atmospheric air. The following sanitary clearance zones are recommended for chromium processing plants: for plants which discharged 200 kg of hexavalent chromium into the air, the sanitary clearance zone should be not less than 100 m, and for plants which discharged 1000 kg of hexavalent chromium into the air daily, the sanitary clearance zone should be not less than 2000 m wide. The existing maximal permissible hexavalent chromium concentration in the air of working premises, now 0.1 mg/m^3, is regarded, in the light of the present investigation, as too high and should be revised to a lower level.

J-4115

Gofman, M. Z.
SANITIZATION OF WORKING CONDITIONS IN CHEMICAL AND PHARMACEUTICAL PLANTS WHICH USE MERCURY AS A CATALYZER. Gigiena i Sanit., 28(12):73-76, Dec. 1963. Translated from Russian by B.S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 12, p. 301-305, 1966.
CFSTI: TT 66-61429

Mercury vapor was found in the air of production rooms of the chemopharmaceutical industry producing synthetic drugs, and of the chemical industry producing technical organic synthetic substances. The presence of mercury vapor was not limited to the air of work rooms in which metallic mercury or its compounds have been used as catalyzers, but also in the air of rooms assigned to the processing successive production phases, as a carry-over by the reaction mass, or by the intermediary half-products. In making sanitary evaluations of such plants this fact should be taken into consideration; it should also play an important part in making sanitary inspections of industrial production plants in which mercury and its compounds are used as catalyzers. Mercury desorption from walls, ceiling, surfaces of equipment, etc. should be regarded as a significant factor in air contamination with mercury vapor in processing rooms of such production industries. Coating all surfaces, including those of equipment, with a mercury vapor nonpermeable varnish or paint will markedly reduce the amount of adsorbed and permeated mercury vapor, the concentrations of which will be still further reduced by the introduction of demercurization of the working premises. In planning new, or reconstructing and renovating previously existing industrial premises of the type under consideration, the location of technological processes should be arranged so as to reduce to a minimum air pollution with mercury vapor. Manual operations should be automated. All production processes which used mercuric compounds as catalyzers, and all associated production states, must be evaluated from the sanitary hygienic viewpoint as industries which employ mercury and which must comply with corresponding sanitary specifications.

J-4173

Gushchin, G. P., I. I. Romashkina, and O. N. Chemyakina
SOVIET STATION DATA ON TOTAL ATMOSPHERIC OZONE FOR 1963. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. 4 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 235-275, 1966.
CFSTI: TT 66-62191

Total atmospheric ozone data recorded by 24 Soviet stations during 1963 are listed in tables, consisting of observation data, number of observations, and total ozone. Vibrations in the aerosol layer still affect ozone measurement results. The results were obtained in direct sunlight. Data were obtained with the universal ozonometer, and with the Dobson spectrophotometer.

J-4256

Burakhovich, M. S.
ATMOSPHERIC POLLUTION BY DISCHARGES FROM CHEMICAL PLANTS. [Zagryaznenie atmosfernogo vozdukha vybrosami khimicheskikh predpriyatii] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(7-9):437-440, July-Sept. 1966.

The purpose of the investigations was the determination of one-time concentrations of injurious substances in the ambient air of populated areas within a radius of 3000-4000 m from two chemical plants. Among the substances included in the determinations were: nitrogen oxides, methanol, ammonia, hydrogen sulfide, formaldehyde, and cyclohexane. The effect of emissions from a power plant on coniferous forests, was also studied. Needles from dried trees contained greater concentrations of sulfur compounds than needles from healthy trees.

J-5256

Ryazanov, V. A.
CRITERIA AND METHODS OF ESTABLISHING THE MAXIMUM PERMISSIBLE CONCENTRATIONS OF ATMOSPHERE POLLUTION IN THE USSR. In: V. A. Ryazanov and M. S. Gol'dberg (eds.), Maximum Permissible Concentrations of Atmospheric Pollution. [Predel'no Dopustimyye Kontsentratsii Atmosfernykh Zagryazneniy.]

Moscow, Meditsina Publishing House, 1964, p. 5-21. Translated from Russian. Joint Publications Research Service, Washington, D. C., 15 p., April 7, 1965.
CFSTI: TT 65-30671

Four different opinions may be found in the literature on approaches to the establishment of maximum permissible concentrations of atmospheric pollution. They are: (1) Only that composition of the air that is observed under natural conditions in noncontaminated human environment can be recognized as normal; (2) Only that content of a given contaminant in the atmospheric air that cannot be removed practically should be considered as normal; (3) Only such concentrations as are economically justified should be considered the standard, i.e. the cost of measures guaranteeing their achievement should be equal to or less than the cost of the damage that they inflict upon society; and (4) Only such concentration of atmosphere pollution as does not exert either a direct or an indirect toxic or unpleasant action on man, does not reduce his ability to work, and exerts no negative influence on his health and frame of mind can be recognized as permissible. In the USSR two types of indices of degree of contamination of the atmospheric air are used: maximum permissible single concentrations and average daily concentrations. They are aimed at preventing the chronic resorptive action of toxic substances during prolonged inhalation. The maximum single permissible concentrations are aimed at preventing atmospheric pollution that might produce reflex reactions through irritation of the receptors of the respiratory organs, chiefly the olfactory region of the nasal cavity.

J-5260

Shamirzayev, Sh. Yu. and D. Kh. Nurullayev
POLLUTION OF THE ATMOSPHERIC AIR OF THE CITY OF TASHKENT AND WAYS FOR ITS REDUCTION. [Zagryaznennost' Atmosfernogo Vozdukha Goroda Tashkenta i Puti Yeye Snizheniya.] Med. Zh. Uzbekistana, No. 9, p. 20-25, 1960. Translated from Russian. Joint Publications Research Service, Washington, D. C., 14 pp., Aug. 7, 1961.
CFSTI: TT 66-27680

The dust and gas suspension exceed the maximum permissible concentration, in various places, by 2 - 100 times. During the winter period approximately 15,000 tons of coal is consumed daily in the city and more than 80,000,000 m^3 of flue gas and 600 tons of ashes are discharged into the air (the burning of 1 kg of coal liberates 5.5 m^3 of flue gas at an average coal ash content of 20 percent). On the average 240 tons of oil is burned daily. There is discharged every hour 60,000 m^3 of flue gas into the atmospheric air, or 1,500,000 every day. Of the twenty samples tested for lead fumes, eight were found to have exceeded the maximum permissible limits; of the 30 samples tested for carbon monoxide, 14 exceeded the maximum permissible limits. Soot was found in 20 samples, in some of them the maximum permissible limits were exceeded four times. At other posts, carbon monoxide exceeds the maximum permissible limits 2 - 5 times (from 14 to 29 mg/m^3, at a norm of 6 mg/m^3); concentrations of lead, 12 to 13 times greater than the maximum permissible limit (at a norm of 0.0007 mg/m^3; samples were found to contain from 0.014 to 0.0096 mg/m^3). The concentration of soot exceeded the maximum permissible limits six times (content of 0.9 mg/m^3). In the area of the asphalt and bituminous plant the dust suspension in the air proved to be 52 times greater than the maximum permissible limit (26 mg/m^3 was found at a permissible concentration of 0.5 mg/m^3); the suspension of sulfur dioxide was 80 times greater (40 mg/m^3 instead of 0.5).

J-5659

Baranov, V. I. and V. D. Vilenskii
PB^{210} IN THE ATMOSPHERE AND IN FALLOUT. Soviet J. At. Energy (English translation), 18(5):645-648, May 1965. 6 refs.

Data are given for the intensity of Pb-210 fallout in the Moscow area during 1961-1963. The intensity of Pb-210 fallout ordinarily increases with increasing amounts of precipitation. The average Pb-210 concentration in fallout is not related to the amount of precipitation, and rises sharply only in dry periods. The intensity of Pb-210 fallout is practically constant in the spring, summer, and fall, and decreases in the winter only by a factor of 2-2.5. The average concentration of Pb-210 in fallout is practically independent of season. The mean annual intensity of Pb-210 fallout in the Moscow area is approximately 2.8 nCi/sq m. The Pb-210 concentration in the surface layer of the atmosphere above the Pacific and Indian Oceans varies within wide limits and, apparently is chiefly determined by meteorological factors. The Pb-210 content in the troposphere above the oceans is probably only slightly less than the content in the troposphere above dry land. The variations in Pb-210 concentration in the surface layer of the atmosphere above land and ocean can be used for studying the meteorological factors responsible for the transport of radioactive isotopes within the troposphere and for their deposition on the surface of the earth. (Authors' abstract)

J-5673

Chalov, P. I. and M. A. Tsevelev
THE RELATIVE LEVELS OF STRATOSPHERIC FISSION FRAGMENT FALLOUT. Soviet J. At. Energy (English translation), 19(5):1450-1451, Nov. 1965. 6 refs.

A possible relative level of stratospheric fission fragment fallout is determined by comparison of the fallout intensity (total fission fragments and several long-lived isotopes) in 1962, when tropospheric fallout was still possible, and in 1963, when it is possible to consider the fallout as purely stratospheric as a result of the prohibition of atmospheric nuclear testing in 1962. The total beta-activity of stratospheric fallout may be greater than, or equal to, the activity of tropospheric fallout. Stratospheric fallout, which contains mainly long-lived isotopes, in this instance is a greater radiation hazard than tropospheric fallout. During the period of a nuclear test ban, the cumulative fallout intensity, and the resulting external gamma-ray dose, are mainly determined by stratospheric fallout.

J-5674

Chupka, Sh., M. Petrashova and I. Tsarakh
SR^{90} CONTENT OF RADIOACTIVE FALLOUT IN WESTERN SLOVAKIA. Translated from Russian. Soviet J. At. Energy (English translation), 18(5):637-639, May 1965. 6 refs.

The absolute and relative content of Sr-90 in radioactive fallout was investigated at four points in western Slovakia during 1962-1963. A significant increase in the Sr-90 content of fallout was found in 1963, particularly in November and December (to 12 percent). The conclusion was reached that, at the present time, radioactive fallout results from long-lived isotopes of stratospheric origin. (Authors' abstract)

J-5728

Kotel'nikov, V. P., V. N. Markelov and B. A. Nelepo
NEW DATA ON ATMOSPHERIC RADIOACTIVITY AND FALLOUT INTENSITY IN THE BLACK SEA BASIN. Soviet J. At. Energy (English translation), 19(5):1447-1449, Nov. 1965.

During the 16th voyage of the Mikhail Lomonosov in August-September, 1964, studies were made of the artificial radioactivity of the atmosphere in the Black Sea Basin. As a result of these studies, determinations were made of the concentration and isotopic composition of the radioactive aerosols in the surface layer of the atmosphere, of the shortlived radioactive isotopes in the surface layer of the atmosphere, and of the intensity of radioactive fallout and its isotopic composition. In addition, studies were made of the correlation between concentration of radioactive aerosols and the intensity of radioactive fallout at the surface of the sea under various meteorological conditions. The isotopic composition of the radioactive products found in the atmosphere, and the rapid variations in their fallout intensity as a function of atmospheric precipitation indicate that there still remains in the stratosphere a considerable amount of radioactive products, produced as the result of nuclear testing, which enter the lower layers of the atmosphere.

J-6671

Bruskin, Z. Z.
EXPERIMENTAL STUDY OF WORKING CONDITIONS AND ATMOSPHERIC AIR POLLUTION WITH ETHYLMERCURIC CHLORIDE DURING TREATMENT OF CEREAL GRAINS IN THE OMAK OBLAST. Gigiena Truda i Prof. Zabolevaniya, 2(5):20-24, 1958. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 264-271, 1962
CFSTI: TT 62-11103

A study was undertaken to evaluate the health hazards involved in the application of ethylmercuric chloride (EMC) to cereal grains. Concentrations of EMC were measured in various working zones and in the open air at varying distances from the operation. The results of these measurements are tabulated; the effectiveness of a respirator is reported; and recommendations are made to improve the protection of the workers.

J-6672

Val'chuk, N. K.
CARBON MONOXIDE IN TYPICAL AUTO-TRACTOR MACHINE SHOPS. Gigiena i Sanit., 24(5):80-82, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 271-275, 1962.
CFSTI: TT 62-11103

Carbon monoxide concentrations were measured at the breathing level of workers in an auto and tractor repair shop. Two hundred air samples were analyzed from various locations and the results are presented in a table. In view of the dangerous levels detected, recommendations are made for the improvement of the situation.

J-6673

CITY STREET AIR POLLUTION BY AUTOTRANSPORT USING ETHYLATED GASOLINE. Gigiena i Sanit., 25(4):15-18, 1960. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 275-279, 1962.
CFSTI: TT 62-11103

A study made of air pollution from automotive vehicles operating on ethylated gasoline is reported. Lead concentrations were measured in 5 cities on the basis of 24 hour averages. The sampling method employed is described. Results indicate heavy pollution of the air with lead. An examination of traffic directing personnel demonstrated deleterious effects ascribed to lead. It is recommended that the use of ethyl-lead gasoline be discontinued.

J-6674

Alekseyeva, M. V. and V. A. Khrustaleva
A STUDY OF AUTOMOTIVE EXHAUST GASES. Gigiena i Sanit., 25(5):10-14, 1960. 5 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 279-284, 1962.
CFSTI: TT 62-11103

Air samples taken in the immediate vicinity of automotive exhausts during heavy traffic conditions were analyzed for formaldehyde, acrolein, ketones, unsaturated and aromatic hydrocarbons, and CO. The data obtained are correlated with the type of vehicle and type of fuel used. The results show that incomplete fuel combustion in motor vehicles is a potent source of air pollution. The effectiveness of a platinum catalytic oxidizing device for treatment of exhaust gases was tested and found to reduce pollution.

J-6869

Krasovitskaya, M. L., L. K. Malyarova and T. S. Zaporozhets
ATMOSPHERIC POLLUTION BY PETROLEUM REFINERIES AND PETROCHEMICAL PLANTS. [Zagryaznenie atmosfernogo vozdukha v raione neftepererabatyvayushchego i neftekhimicheskogo predpriyatiya.] Hygiene and Sanitation (English translation of Gigiena i Sanit.), 30(4):118-121, April 1965. 6 refs.

The nature of the atmospheric pollution in the area around a large petrochemical industrial complex was investigated and its effect on the health of children was studied. The pollutants are hydrocarbons, carbon monoxide, hydrogen sulfide, sulfur dioxide and chlorinated hydrocarbons. Three stationary observation points were established to examine the purity of air in the city. One point was within the industrial complex, another 2.5 km away and a third 20 km from the plant. The concentration of atmospheric pollutants was highest in the first district, a little lower in the second and even lower in the third. At the most distant observation point point the atmospheric concentrations of CO and SO_2 exceeded the maximum permissible levels. The content of harmful substances exceeded the maximum permissible concentrations in 51.2 percent of all the analyses. Studies of the records of first visits at children's clinics showed that, other conditions being equal, the incidence of influenza, upper respiratory tract infections, the common infections of childhood, and pneumonia, were higher in children residing in the area affected by the discharge, than in the control group, the difference being statistically significant. The children showed diminished immunobiological and redox reactions, as well as certain changes that are specific for petroleum gases, such as leucopenia, thrombocytopenia and hypotonia. A need for engineering improvements to reduce the industrial discharges from the oil refineries and petrochemical plants was demonstrated.

One of the most important ways of combatting air pollution, which is still awaiting its engineering solution, is the extraction of sulfur from the raw materials and fuel used in the process of petroleum refining. Another necessary measure is the prevention of loss of petroleum products by evaporation from storage tanks, by hermetically sealing the reservoirs against gas leaks, their thermal insulation, and the installation of the floating protective covers.

J-6872

Shesterikova, K. L. and P. N. Strogal'shchikova
ATMOSPHERIC POLLUTION BY NITROGEN OXIDES. [Zagryaznenie atmosfernogo vozdukha okislami azota.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.) 30(5):232-233, May 1965. 1 ref.

Determinations of nitrogen oxide concentration in the streets of Chelyabinsk, Russia, during peak traffic hours were compiled. In 51 percent of the samples, nitrogen oxides exceed the maximum permissible concentration (0.3 mg/m^3). The lowest concentrations of nitrogen oxides are found at two points, where the traffic density is lower and the broad streets are situated at higher elevations, therefore in well ventilated locations.

J-6886

Borisyuk, Yu. P. and B. S. Ruchkovskii.
CONTAMINATION OF AIR BY 3,4-BENZPYRENE AROUND CERTAIN INDUSTRIAL ENTERPRISES. [Zagryaznenie 3,4-benzpirenom atmosfernogo vozdukha v raionakh nekotorykh proizvodstevennykh predpriyatii.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1): 107-108, Jan. 1965. 4 refs.
CFSTI: TT 66-51033

Atmospheric pollution by 3, 4-benzpyrene in the vicinity of certain industrial enterprises is reported. Samples were taken by the aspiration method, using the FFP-15 grade filter. In taking a single sample, about 2000 m^3 air were passed through the aspirator. The deposit on the filter was extracted with petroleum ether. The samples were tested for 3, 4-benzpyrene by fluorimetric spectrography and spectrophotometry. Considerable quantities of 3, 4-benzpyrene were discharges of metallurgical and asphalt-concrete enterprises. Only traces of 3, 4-benzpyrene were detected in the vicinity of agglomeration factories of ore-dressing plants, and this is probably explained by the technological conditions of agglomeration.

J-6904

Kirichenko, V. N., B. I. Ogorodnikov, V. D. Ivanov, A. A. Kirsh and V. I. Kachikin.
SUBMICROSCOPIC AEROSOLS OF SHORT-LIVED DAUGHTER PRODUCTS OF RADON IN MINE AIR. [Soderzhanie submikroskopicheskikh aerosolei korotkozhivushchikh dochernikh produktov radona v rudnichnom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(11): 308-314, Nov. 1965. 15 refs.

Two methods of measuring the concentration of free atoms of the shortliving daughter products of radon under actual mining conditions were described. The majority of the daughter products of radon settle on fine particles in the free atmosphere, therefore measurements of these particles down to size 10^{-7}cm are of great interest. The daughter products of radon are constantly discovered in different parts of the mine. When there is no work, the proportion of free atoms is considerably higher than when work is being carried out. The results cannot be referred to as free atoms because in reality not only free atoms but also a spectrum of very fine particles approaching atomic dimensions are counted. However, it is these settling particles together with free atoms which may give rise to excessive irradiation of the respiratory tract of miners.

J-7141

Dubrovskaya, F. I.
THE EFFECT OF SMOKE EMISSION PURIFICATION ON AIR DUST CONCENTRATION OF A LARGE CITY. Gigiena i Sanit., 23(1):69-71, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 1, p. 118-121, Jan. 1960.
CFSTI: TT 60-21049

Over a period of several years the pollution of Moscow air was studied. The accumulated data presented the opportunity to determine the changes in air pollution intensity which resulted from the introduction of control measures. One of the basic measures was an official mandatory requirement that fly ash be removed from smoke gases emitted by electric power and heating plants and by boiler operated manufacturing and production industries. A comparison of the data under study with the value representing the limit of allowable concentration of dust in the atmospheric air of inhabited localities, shows that in most of the samples studied the dust concentration exceeded the maximal single limit of allowable dust concentration of 0.5 mg/m^3. Thus, despite considerable attainment in the fight against air pollution in Moscow, the condition of the air with regard to dust concentration failed to come up to the official sanitary requirement. Data regarding dust concentrations in different sections of the city during cold and warm weather, from 1946 - 1956, are presented in graphs.

J-7290

Kruglikova, Ts. P. and V. K. Elfimova
RESIDENTIAL INDOOR AIR POLLUTION WITH ATMOSPHERIC SULFUR DIOXIDE (GAS). Gigiena i Sanit., 23(3): 75-78, 1958. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 68-73, March 1960.
CFSTI: TT 60-21188

The degree of atmospheric SO_2 penetration into residential dwellings was studied. Two sets of air samples were taken in the vicinity surrounding a chemical plant: one set at distances ranging between 200 - 300 meters and the other between 800 - 1000 meters from the point of air pollution discharge. Only one set of air samples was collected at a distance of 200 meters from a crude oil processing plant. In all, 183 air samples were collected in industrial regions over a period of one year; 106 were outdoor (atmospheric) air samples, 77 samples were collected inside residential dwellings. A total of 179 air samples were collected in two streets; 104 samples were collected indoors and 75 out of doors. Sixty-five air samples were collected in a control region: 25 atmospheric and 40 inside the Botanical Garden buildings. A correlation is demonstrated between the atmospheric and indoor air SO_2 concentrations in industrially air polluted regions, in city blocks free from industrial type of air pollution and in the control area.

J-7292

Grushko, Ya. M., P. P. Dikun, L. M. Shabad, T. I.

Rukavishnikova, L. M. Zak, and O. M. Valasenko
A COMPARATIVE STUDY OF ATMOSPHERIC AIR POLLUTION WITH CARCINOGENIC SUBSTANCE (3, 4 BENZPYRENE) IN IRKUTSK AND ANGARSK. Gigiena i Sanit., 23(4):7-10, 1958. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 81-86, March 1960.
CFSTI: TT 60-21188

Most of the fuel consumed in Irkutsk is burned by boiler operated manufacturing and production plants and by residential heating installations at comparatively low temperatures, which results in an extensive emission of soot into the atmospheric air. In addition, the Irkutsk smokestacks are of insufficient height for proper dispersion. At the Angarsk electric heat station the coal is burned at 1100°, which results in the production of a minimum amount of soot. The boilers are equipped with electrostatic precipitators which remove 95 percent of the ash from the discharge gases, and the smokestack of the stations is 120 m high. All the above aid is sharply reducing the atmospheric air pollution. It was thought that the content of 3, 4-benzpyrene in the atmospheric air of Irkutsk and Angarsk may differ sharply. To determine the correctness of such an assumption, snow samples were collected in 1956 at certain points in Irkutsk and in Angarsk which contained sedimented industrial smoke fall-out; these were studied for their content of 3, 4-benzpyrene. The results indicated that the control measures instituted in the city of Angarsk proved adequate for the protection of the atmospheric air of the residential part of the city, especially as related to the prevention of dissemination throughout the city of carcinogenic hydrocarbons.

J-7294

Belousov, A. Z., Yu. V. Novikov, V. F. Oreshko, and B. I. Polivoda
AEROSOL RADIOACTIVITY OF THE ATMOSPHERIC AIR. Gigiena i Sanit., 23(10):17-22, 1958. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 96-102, March 1960.
CFSTI: TT 60-21188

Observations of radioactivity in the ambient air were conducted at 3 points in a city and its surroundings. Air samples were taken 1.5 - 2.0 m above the surface of the ground and studied for α and β activity in aerosols. Meteorological observations were conducted simultaneously. In the course of a year, 967 atmospheric air samples were examined. City and suburban intensities of radioactivity emitted by short-lived isotopes were as follows: city average for beta-radiation was 2.4×10^{-13} C/l and 1.23×10^{-13} C/l for alpha-radiation; corresponding averages in the suburbs were 2.54×10^{-13} and 1.6×10^{-13} C/l. The differences between the city and suburban radiation values are within the limits of experimental error; for all practical purposes the radiation intensities in the city and suburban air were the same. Air radioactivity constantly fluctuated over an extended period of time as well as within 24 hours. The fluctuation range stayed within narrow limits and may have been caused by changes in the meteorological conditions. Increase in air dust concentration was paralleled by an increase in atmospheric air aerosol radioactivity. Changes in the isotope composition of atmospheric air aerosols were slight and the average half-life of radioactive aerosols for alpha-active and beta-radiation ranged between 34 - 36 min.

J-7300

Dikun, P. P. and I. I. Nikberg
A STUDY OF AIR POLLUTION WITH 3, 4-BENZPYRENE IN THE VICINITY OF AN OLD PITCH-COKE PLANT. Vop. Onkol., 4(6):669-674, 1958. 6 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 125-140, March 1960.
CFSTI: TT 60-21188

Analyses were made of three sets of samples collected in the area of the pitch-coke plant at different times, different distances, and in different directions from the plant. Set 1 consisted of 6 samples, and set 3 consisted of 3 aspiration samples. A comparison of pollution before and after the plant was modernized shows that 3, 4-benzpyrene content of sweepings collected between the inside and storm windows before the plant was modernized was 100 times greater than after the improvements were installed. (0.03 to 0.05 percent as against 0.0003 percent) Dust collected in 1955 from the bricks stored on the plant grounds contained 10 times as much 3, 4-benzpyrene as the dust collected between the windows in 1957 (0.003 to 0.0090 percent against 0.0003 percent). The fact that window pane washings gave negative or trace tests for 3, 4-benzpyrene demonstrated the significant reduction in air pollution attained by the plant combustion modernization. This is further confirmed by a comparison of analyses of aspiration samples. After the introduction of the improvements aspiration samples of 15 to 45 m^3 of air contained only traces of pollutants. Comparison of analytical results collected in 1957 with samples similarly collected in 1955 also shows a substantial reduction in total pollution (95, 370 and 820 mg per m^3 in 1955 as against 2.5 mg in 1957) and in 3, 4-benzpyrene (0.002, 0.005, 0.400 mg per m^3 in 1955 as against 0.0004 mg in 1957). Thus, results of the 1957 investigation revealed that pollution of the air in the vicinity of the pitch-coke plant decreased sharply after the coke furnaces were modernized.

J-7304

Los', L. I., A. G. Sadivnikova, R. M. Soboleva and D. Ya. Turets
THE QUALITY OF ATMOSPHERIC AIR IN THE VICINITY OF PETROLEUM REFINERY PLANTS. Gigiena i Sanit., No. 8, p. 8-13, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 175-180, March 1960.
CFSTI: TT 60-21188

The present study extended over 1947 - 1949. Air samples for the determination of hydrocarbons were collected in special 100 - 200 ml pipettes. Hydrocarbons were determined by the combustion method and carbonic acid by the Reberg method. The sensitivity of the method was 0.01 - 0.02 mg of carbon per 1 liter of air. Qualitative hydrogen sulfide tests were made with lead acetate paper and quantitative by Khrustaleva's silver nitrate method. A maximum of 1 liter of air was aspirated through a microdrexell absorber. The sensitivity of Khrustaleva's method was 0.0005 - 0.001 mg/l. Air samples were collected at production assemblies 3 - 4, 7 - 8, 45 and others throughout the plant. A subjective study was made by questioning 174 residents of the different community areas. Residents of the south and east settlements noticed the odor of petroleum becoming stronger when the wind blew toward the settlement. Residents of the upper residential area noticed the unpleasant odor only when the wind blew from the plant in the area. In the summer all had noticed a stronger odor of petroleum in the air; they complained that it was not possible to open the windows or ventilators for house airing. Residents of the south settlements complained of metallic objects tarnishing. It is recommended that working conditions in the plant be improved and pollution of the atmospheric air of the populated areas be decreased by instituting the following sanitary measures: install equipment for the removal of sulfur compounds from the petroleum; enforce prevention of gas leakage in manufacturing process; and sanitize surroundings by planting trees, shrubs and other greenery.

J-7478

Dmitriev, M. T. and O. I. Yurasova
CONTENT OF THE PRODUCTS OF THE RADIOLYSIS OF AIR IN THE WORKING CHAMBERS OF A POWERFUL GAMMA UNIT. [K voprosu o soderzhanii produktov radioliza vozdukha v rabochikh kamerakh moshchmykh -ustanovok.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(3):442-447, March 1967. 10 refs.
CFSTI: TT 67-51409/1

The degree of formation of ozone and nitrogen oxides in the air of the working chamber of a powerful gamma-unit was investigated. The ozone was determined from the decomposition of potassium iodide, while the nitrogen oxides were determined by Griess's reaction as modified by Gorodetskii (1960). The nitrogen oxides were determined at the worksite in the respiratory zone of the operator at a distance of 1.5 - 3m from the irradiator, 1 min after its immersion in water and the entry of people into the working chamber. With an air change factor of 10 vol/min, the plenum-exhaust ventilation of the working chamber of the gamma-unit reduces the concentration of nitrogen oxide at the worksites to 0.04 - 0.9 mg/m^3, which is 1.5 - 1,100 of the maximum permissible concentration. Considerable concentrations of ozone were found in the space between the irradiator planes at the moment of irradiation. With an irradiation time of 20 min and dose rates of 300 to 600 rad/sec, the concentrations were 0.21 to 1.92 mg/m^3, when the plenum-exhaust ventilation was turned off. When it was working, the concentration of ozone decreased to 0.34 - 0.84 mg/m^3, which is still above the maximum permissible concentration for industrial premises. In cases where it is necessary to exclude the harmful effects of ozone on the irradiated material, the ventilation calculations should take into account the high concentration of ozone near the radiator.

J-7580

Zvinyatskovskii, Ya. I.
ATMOSPHERIC POLLUTION BY COAL-DRESSING PLANTS. [Zagryaznenie atmosfernogo vozdukha vybrosami ugleobogatitel'nykh fabrik.] Hygiene and Sanitation (English translation of Gigiena i Sanit.), 30(9):438-440, Sept. 1965.
CFSTI: TT 66-51033/3

The nature and degree of atmospheric pollution were investigated in the neighborhood of two coal-dressing plants at Gorlovka, in the Donetsk Region. At both places the work is carried out on the gravity principle by foam flotation in an aqueous medium. The wet coal concentrate is dried in special installations by the hot gases generated by the combustion of the waste produced by coal dressing. Having passed through the drying installation, the drying gases are discharged into the atmosphere. The drying departments are equipped with dust-trapping devices, which free the issuing gases from coal particles. Plant No. 1 is equipped with three successive stages of dust-trapping devices: a cyclone, a multicyclone, and wet-dust separator. Plant No. 2, uses a multicyclone, thence through a V-shaped gas flue half-filled with water, into an apparatus which saturates the gases with water sprays. The department in which the concentrate is dried is the main source of atmospheric pollution with coal dust and gases. The concentrations of dust, sulfur dioxide, and carbon monoxide, as well as of the flotation reagents used for foam flotation, and of the synthetic alcohols and phenols which are the products of their decomposition were determined. The samples were taken at distances of 300, 500, and 800 m from each plant, mainly on the leeward side, as well as in the presence of changeable winds. In all cases, determinations were made of the maximum one-time concentration. At distances of 300, 500, and 800 m from each plant, the one-time maximum concentrations of dust, sulfur dioxide, and carbon monoxide were considerably higher than the maximum permissible values. Sulfur dioxide and carbon monoxide concentrations at distances of 500 m from plant No. 1 were higher than at a distance of 300 m and became somewhat lower at a distance of 800 m. On the other hand, in the case of plant No. 1 the highest concentrations were found at a distance of 300 m, with successive decreases at distances of 500 and 800 m. This agreed with the calculated values. The 300 m width of the sanitary protective zone is too narrow. Alcohols from flotation reagents were discovered in all samples, in concentrations ranging from 0.1 to 0.9 mg/m^3; phenols from flotation reagents were detected in 86 percent of all samples, in concentrations ranging from 1 to 7.5 mg/m^3. After the flotation reagents had been replaced alcohols and phenols were no longer detected in the air. The drying departments of the coal-dressing plants were the principal source of pollution of the air around the plants with coal dust, sulfur dioxide, carbon monoxide and flotation reagents.

J-7830

Popov, V. A.
THE PRESENCE OF OXIDANTS IN THE ATMOSPHERE OF CERTAIN TOWNS IN THE U.S.S.R. [Prisultstvie oksidantov v atmosfernom vozdukhe nekotorykh gorodov SSSR.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 31(1-3):3-8, Jan.-March 1966.

Oxidants in the air of certain town of the Soviet Union were measured by the phenolphthalein method. The standard color scale was a mixture of an alcoholic aqueous solution (3:2) of phenolphthalein and 1 percent borax solution. The maximum concentration of oxidants on the highways of Moscow and Baku on sunny days was as high as 0.1 mg/m^3, and on cloudy days did not exceed 0.03 mg/m^3. A study of this type of pollutants in Baku revealed their presence in the area of oil refineries at concentrations within 0.15 mg/m^3. On the other hand, the maximum value of oxidants in the vicinity of Batumi oil refinery was considerably lower (0.04 mg/m^3).

J-8151

Borisova, M. K.
EXPERIMENTAL DETERMINATION OF THE LIMIT OF ALLOWABLE CONCENTRATION OF DICHLORETHANE IN ATMOSPHERIC AIR. Gigiena i Sanit., 22(3):13-19, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 110-118, May 1960.
CFSTI: TT 60-21475

Data were obtained regarding the intensity and other characteristics of dichlorethane air pollution by industrial production and manufacturing plants; parallel with this

Some experimental data were secured regarding the effect of low dichlorethane concentrations on man. Chlorethane determinations were made by the microcombustion method in a gas analyzer. The results obtained for each plant investigated show that the average concentration ranged from 3.5 to 19.4 mg/m^3. The effect of low concentrations of dichlorethane on man was studied by the method of threshold of odor perception of dichlorethane by the adaptometer method and by the methods of plethysmography and spirography. Twelve test subjects sensed the odor of dichlorethane in 23.2 mg/m^3 concentrations, 6 in 17.5 mg/m^3 concentration and one each in 12.2 and 24.9 mg/m^3 concentrations. The results of experiments indicate that a 6 mg/m^3 concentration was the threshold concentration of dichlorethane affecting the functional state of the vision analyzer and of the vascular and respiratory reactions which was below the threshold concentration sensed by the olfactory organs. It is suggested that the limit of maximal single concentration of dichlorethane in atmospheric air should not exceed 4 mg/m^3 in Russia.

J-8161

Kalyuzhnyi, D. N., S. A. Davydov, L. G. Dukarskaya and M. B. Aksel'rod
ATMOSPHERIC AIR POLLUTION WITH SULFUR DIOXIDE FROM MINING ROCK DUMPS. Gigiena i Sanit., No. 5, p. 19-24, 1950. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 171-176, May 1960.
CFSTI: TT 60-21475

Emission of sulfur dioxide into the air was caused by the oxidation of sulfur compounds present in dumped coal and waste rock. The intensity of waste rock burning in rock dumps and the quantity of sulfur dioxide liberated depended upon the chemical composition of the coal and the waste rock, the height of rock dumps, the duration of their accumulation, meteorological conditions, etc. In mines with an intensive burning of waste rock and with high rock dumps increased concentrations of sulfur dioxide were found up to 1500 m from the source. In mines with low and slow burning dumps, diffusion of sulfur dioxide did not extend beyond 750 m. Sanitary clearance zones between rock dumps and residential quarters should be 500 - 1500 m wide, depending on the intensity of dumps' burning, the direction of prevailing winds, and the chemical composition of the coal and of the waste-rock. The method of filling in emptied coal veins, or "butovka," should be put into wide practice in coal mining by organizations concerned with this problem. This should eliminate further dump heap accumulations. Waste rock should also be used for filling in of ravines. Extinguished dumps should be planted with appropriate shrubs and trees.

J-8163

Shvarts, Ya. I. and L. A. Zil'berg
ZONAL STUDY OF ATMOSPHERIC AIR POLLUTION IN AREAS SURROUNDING A ROOFING TAR PAPER PLANT. Gigiena i Sanit., No. 7, p. 53-54, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 3, p. 186-187, May 1960.
CFSTI: TT 60-21475

Determinations were made of the content of dust, hydrocarbons, and sulfur dioxide in the vicinity of a roofing tar paper plant. Air samples were collected on the windy side, and 2.5 m above the ground on all sides of and at different distances from the plant. Hydrocarbons were determined by the combustion method; sulfur dioxide was determined nephelometrically; and dust was determined gravimetrically. Carbon dioxide determinations were made in 13 air samples collected 50 m from the plant. The concentration of carbon dioxide varied between 0.048 - 0.302 mg/l of air. Hydrocarbon concentrations varied between a trace to 0.35 mg/m^3. SO_2 varied between 0.0022 and 0.0176 mg/m^3; and dust between 1.25 and 5.59 mg/m^3. To obtain more accurate results with reference to the basic source of air pollution, 8 additional laboratory analyses were made of air samples collected 1.3 km from the plant at a point far away from industrial establishments. Sulfur dioxide concentrations varied between 0.0012 - 0.0015 mg/l; and dust concentrations varied between 1.05 and 1.12 mg/m^3. This was taken as evidence of the fact that air pollution in the vicinity of the plant was caused by the emission of gases and by the dust coming from the plant.

J-8189

Karimov, M.
HYGIENIC EVALUATION OF ATMOSPHERIC AIR IN THE VICINITY OF AN ABRASIVE PLANT. Gigiena i Sanit., 23(11):22-23, 1958. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 141-144, Aug. 1960.
CFSTI: TT 60-21913

The Leningrad abrasive plant produces abrasive instruments using such raw materials as aluminum, bauxites, clays, feldspars, pegmatitites, sodium silicate, boron glass, and anthracite. The crushing, grinding and distribution of the raw materials are dry processes which emit great quantities of dust. During 1955 and 1956 dust and SO_2 concentrations were measured at various distances from the plant and the results are tabulated. Silicon dioxide was determined in approximately half of the dust samples. A study was also made of the incidence of diseases among children up to 15 years old for the year 1955, based on their visits to the polyclinic. Incidence of children's diseases in the plant area was higher than in the control area.

J-8192

Lampert, F. F.
EFFECT OF GARAGES AND FILLING STATIONS LOCATED IN RESIDENTIAL SECTIONS ON HEALTH AND LIVING CONDITIONS. Gigiena i Sanit., 24(3):74-76, 1959. Translated by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 161-164, Aug. 1960.
CFSTI: TT 60-21913

To determine the nature and extent of the effects of public garages in the residential areas, a study was made of six residential buildings. Garages housing from 6 to 36 automobiles were parts of 2 of the 6 buildings; in 3 of the six buildings the garages were detached by only 5 to 17 meters from the dwellings, and in one a 30-automobile garage was located. In addition to the garages, a filling station, which was located at 18 m from the windows of an apartment house, was also investigated. In the air of garages, the carbon monoxide concentration was higher than the maximum permissible concentration for workshops, which is 0.03 mg/l. The carbon monoxide concentrations in the apartment air exceeded the 0.06 mg/l single maximum permissible concentration. The greatest number of samples with carbon monoxide concentration above 0.03 mg/l was found near the gasoline pump and in apartments located 18 m from the pump which constituted 58 and 18 percent.

J-8196

Kononova, V. A.
SANITARY CLEARANCE ZONES BETWEEN RESIDENTIAL SECTIONS AND PLACES OF FUEL STORAGE IN SOVKHOZES OF SARATOVSK (OBLAST) TERRITORY. Gigiena i Sanit., 23(6):11-14, 1958. 3 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 187-192, Aug. 1960.
CFSTI: TT 60-21913

The mechanization of agriculture in the Soviet Union is accompanied by the proliferation of centers where automotive agricultural machinery is housed and fuel for the machinery is stored. The prescribed 75 m wide sanitary clearance zone between residential sections and fuel storage centers was evaluated for effectiveness in protecting residents from gasoline fumes and automotive emissions. Tetraethyl lead and hydrocarbons were measured in air and soil at varying distances from the gasoline storage tanks. It is concluded that a sanitary clearance zone of 75 m was inadequate.

J-8198

Stankevich, B. E. and M. I. Isaeva
SELECTION OF AIR INTAKE POINTS FOR VENTILATION OF PREMISES IN PETROLEUM PROCESSING PLANTS. Gigiena i Sanit., No. 8, p. 27-34, 1954. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 202-208, Aug. 1960.

Previous investigators had concluded that even under most unfavorable conditions of refinery building location with regard to hydrogen sulfide accumulation, the air intakes located 18 - 20 m above the ground could supply air sufficiently pure for practical ventilation. In an effort to disprove this conclusion, studies were made at two petroleum refineries. Air samples taken simultaneously at 5, 10 and 15 m above the ground were analyzed for the content of hydrogen sulfide, hydrocarbons, carbon monoxide and sulfur dioxide. It was found that the installation of air intakes at 15 - 20 m fails to improve the quality of ventilation air, and in many cases might worsen it. In view of the complexity and specific conditions which may exist in some modern oil refineries, the choice of necessary sanitary measures can be made only on an individual basis by taking into consideration actually existing conditions.

J-8202

Sosnovskii, S. I.
DUSTINESS AND METEOROLOGICAL CONDITIONS IN SEED HOUSES AND IN SOME SECTIONS OF COTTONSEED OIL MILLS. Gigiena i Sanit., No. 11, 43 p., 1955. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 249-250, Aug. 1960.
CFSTI: TT 60-21913

Dust conditions were investigated in seed houses and cottonseed oil mills in 1953 and 1954. In the cotton fiber room, the seed meal room, the cleaning and hulling sections, the average air dustiness varied between 101.4 and 290.5 mg/m^3 when the low grade cotton varieties were processed. The cleaning of first quality cottonseeds produced air dustiness which ranged between 31.4 - 68.4 mg/m^3. The inorganic dust in the same sections of the plant contained total silicon dioxide which fluctuated between 43 and 15 percent, and free silicon between 15 and 18 percent, depending upon the composition of the soil on which the cotton was grown. The dust in the seed house, the fiber room, grinding, cleaning and huller-separator sections contained 0.3 - 0.5 percent of gossypol, which, taken in large quantities with the food, proved toxic to animals and humans.

J-8205

Tsapko, G. E.
EXPERIMENTAL DETERMINATION OF AIR DUSTINESS IN KIEV. Gigiena i Sanit., 24(2):74-75, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 254-255, Aug. 1960.
CFSTI: TT 60-21913

Air samples were taken at three observation points located: (a) in a densely populated area, the site of large industrial plants and of intensive railroad and automobile traffic; (b) in a residential section free from large industrial plants and abounding in trees and shrubs, and (c) in a garden and park section. The air investigations were conducted by the gravimetric method (487 samples) and by the count method (977 samples). The air was aspirated at the rate of 25 - 30 l/min for 1 1/2 - 2 hours to a volume of 3000 liters. Dust particles were counted microscopically at 400 magnification, using an ocular and an objective micrometer. By this method it was possible to make the counts and to determine simultaneously the size of dust particles up to 1 μ and larger in visual fields, the total area of which equalled 1 mm^2. The data produced by the investigation are presented in tables.

J-8209

Nishchii, R. A.
OXYGEN BLAST EFFECT ON AIR IN ELECTRIC STEEL SMELTING MILLS. Gigiena i. Sanit., 24(2):78-80, 1959. 10 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 27-30, Jan. 1961.
CFSTI: TT 61-11149

Studies of air in a mill were conducted during the use of oxygen blast at various times during each of the 3 shifts and at different seasons of the year. Air samples were analyzed for manganese vapor, dust, sulfur dioxide, and carbon monoxide. The samples were taken at the operating platform in front of 20-ton electric furnaces which were not equipped with exhaust fans; general mechanical ventilation was not installed in this mill. Air samples were taken 5 m from the furnace "window" where the worker stood 1.5 m above the floor; samples were taken 30 - 15 minutes before starting the oxygen blast and 15 - 30 minutes after. A total of 248 analyses were made. The use of oxygen blast in connection with electric furnace steel smelting increases the rate of combustion products discharge, which permeates through the mill premises and causes general air pollution. The problem of general air pollution can be solved in steel smelting plants which do not use the oxygen blast method by making mandatory the installation of exhaust ventilation equipment at the location of the smelting furnace. In steel smelting plants in which the oxygen blast method has been instituted, air pollution should be abated or eliminated by the installation of dust and smoke-catching equipment directly near the electric furnace.

J-8213

Chjen-tsi, Chjao
BASIC HYGIENIC DATA FOR THE DETERMINATION OF STANDARD LIMIT OF ALLOWABLE CONCENTRATION OF METHANOL VAPOR IN ATMOSPHERIC AIR. Gigiena i Sanit., 24(10):7-12, 1959. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 59-66, Jan. 1961.
CFSTI: TT 61-11149

The threshold of odor perception, the effects of low methanol concentration on reflex changes and the concentration of methanol in air near two industrial sources were determined. This data was utilized to suggest the maximum allowable concentration of methanol in the air in Russia. The threshold of methanol odor perception was 4.3 mg/m^3 and the maximal non-perceived concentration was 3.7 mg/m^3. The threshold of methanol vapor reflex action on eye sensitivity to light was 3.3 mg/m^3. The chronic effect of methanol vapor following 12 hours daily exposure for 3 months in 50 mg/m^3 concentration elicited in experimental animals changes in motor chronaxy, as shown by changes in the time relationships of extensor and flexor chronaxies. Chronic inhalation exposure to methanol in 1.8 mg/m^3 concentration had no effect on either motor chronaxy or the rheobase of animals. It is suggested that methanol concentration of 1.5 mg/m^3 be adopted as the maximal single allowable concentration of methanol in atmospheric air.

J-8214

Fyn-Djui, Duan
BASIC DATA FOR THE DETERMINATION OF LIMIT OF ALLOWABLE CONCENTRATION OF HYDROGEN SULFIDE IN ATMOSPHERIC AIR. Gigiena i Sanit., 24(10):12-17, 1959. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 66-73, Jan. 1961.
CFSTI: TT 61-11149

Data from several experiments is presented. The threshold of hydrogen sulfide odor perception was between 0.012 and 0.03 mg/m^3. The threshold of hydrogen sulfide reflex effect on eye sensitivity to light was at 0.01 mg/m^3. Exposure of rats to 10 mg/m^3 concentration of hydrogen sulfide under chronic experimental conditions for 12 hours daily over 3 months produced changes in the functional state of the central nervous system, irritated the mucosa of the trachea and bronchi and incited morphologic changes in the brain cortex. Hydrogen sulfide concentrations of 0.02 mg/m^3, under similar experimental conditions, produced only slight or negligible changes in the functional states of the central nervous system and barely perceptible irritation of the mucosa of trachea and bronchi. On the basis of the study 0.008 mg/m^3 is proposed as the maximal single and also the 24-hour average concentration of hydrogen sulfide in the atmospheric air. In the center of Moscow, at different distances from the source of hydrogen sulfide discharges, the air contained hydrogen sulfide concentrations between 0.0092 - 0.0005 mg/m^3, with the highest concentration predominating during the cold months. In close proximity of a plant manufacturing dyestuffs the air contained high concentrations of hydrogen sulfide, despite the fact that the plant had some type of gas purifying equipment. Even at a distance of 1250 m from the source of gas emission the concentration of hydrogen sulfide in the air exceeded the allowable limit.

J-8438

Berdyev, Kh. B., N. V. Pavlovich and A. A. Tuzhilina
EFFECT OF MOTOR VEHICLE EXHAUST GASES ON ATMOSPHERIC POLLUTION IN DWELLINGS AND IN A MAIN STREET. [Vliyanie vybrosov avtotransporta na zagryaznenie vozdukha zhilykh pomeshchenii i ulichnoi magistrali.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):424-426, April-June 1967. 1 ref.
CFSTI: TT 67-51409/2

Considerable concentrations of carbon monoxide, nitrogen oxides, lead compounds and dust were measured in the atmosphere of main streets and in the living premises, exceeding the maximum permissible concentrations. The 50 percent increase in the density of vehicular traffic in 1963 in comparison to 1961 (from 780 to 1,200 vehicles per hour) increased only the carbon monoxide concentration in the street air (by 50 percent), all other indices remaining at the previous level. A comparison of the concentrations of health hazards at different levels revealed the highest concentration of carbon monoxide in the living rooms of the third story and those of dust and lead in the first story. The concentrations of nitrogen oxides were the same in the street, as those in the first and the third stories.

J-8780

Prave, V. E., F. I. Radutskii, R. I. Radomysl'skaya and A. L. Volhova
THE CHLORINE CONTENT IN THE AIR OF DWELLINGS DISINFECTED WITH CHLORAMINE SOLUTIONS. [Soderzhanie khlora v vozdukhe zhilykh pomeshchenii posle dezinfektsii rastvorami khloramina.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):280-283, July-Sept. 1967. 3 refs.
CFSTI: TT 67-51409/3

The air in places where disinfection had been carried out was tested. These were dwellings in the Timiryazev district of Moscow which had been disinfected after open cases of tuberculosis had been transferred to the hospital, or after cases of infectious hepatitis, dermatomycosis and other communicable diseases. Six samples were taken in each case: two during disinfection of the room and two while the corridor surfaces were being sprayed. Tests of 60 air samples showed that the chlorine concentration in closed premises varied from fractions of a milligram to tens of milligrams per m^3 during the final disinfection with aqueous chloramine solutions. Chlorine concentrations below the maximum permissible level for working premises were found in 1/10 of all samples; in 34 cases they were found to be several times higher than the maximum level (up to 10 mg/m^3) and in 1/3 of the cases they were ten or more times the maximum permissible concentration (up to 56 mg/m^3). Thus, the chlorine content exceeded the maximum permissible level for working premises in 9/10 of all samples. The effects of various factors (or of their combinations) on the chlorine content of the air of premises disinfected with chloramine solutions were not studied. Nevertheless, certain important factors must be mentioned. The chlorine content in the air of the premises was not entirely dependent on the concentration and amount of chloramine solution used, but also depended on other factors, such as the rate of release of chlorine from the activated solution into the air. The disinfection techniques used also played a certain part, such as dipping objects in the disinfection solution, wiping objects with a rag wetted with the solution, or spraying. (Authors' summary, modified)

J-9272

Prinz, Bernd
A NUMERICAL RELATIONSHIP BETWEEN THE IMMISSION PARAMETERS OF A COLLECTION AND THOSE OF A SUBGROUP OF THIS COLLECTION. Staub (English translation), 27(10):18-21, Oct. 1967. 4 refs.
CFSTI: TT 67-51408/10

An equation has been derived showing the relationship between characteristic immission magnitudes for a "collective", and characteristic immission magnitudes for subgroups of this "collective." The equation can, however, only be expressed as an approximation, because there is no exact solution. Two examples, selected at random, with chronological and spatial distribution of a "collective" of SO_2 measurements explain the method developed. (Author's summary)

K-4818

Wiethaup, H.
AIR POLLUTION CONTROL LEGISLATION IN LOWER SAXONY AND RHINELAND-PALATINATE AND THE NEW LAWS IN BAVARIA. Staub (English translation), 26(12): 36-38, Dec. 1966. 15 refs.

A brief survey is presented of air pollution control legislation existing in Niedersachsen and Rheinland-Pfalz, and indicates the imminent introduction of this legislation in Bayern. The laws mentioned above correspond or will correspond to air pollution control laws in Nordrhein-Westfalen and in Baden-Wurttemberg. (Author's summary)

K-5144

COLLECTION OF STATUTES AND CABINET ORDERS RELATING TO AIR POLLUTION CONTROL (JAPAN). Japanese Preprint, 1962. Translated from Japanese, 57p., April 1963.

The Air Pollution Control Act (Statute No. 146 of 2 June 1962) of Japan was enacted for the purpose of controlling the disposition of soot and smoke created by plants and workshops so as to prevent danger to public health due to pollution and to insure the maintenance of healthy living condition, the steady development of industry, and for the purpose of establishing systems for conciliation of disputes concerning air pollution. Its chapters which are included herein cover the following: (1) General Principles; (2) Designated Areas and Discharge Level; (3) Facilities Creating Soot and Smoke and the Legal Obligations of those Responsible for them; (4) Emergency Measures; (5) Mediation; (6) Miscellaneous Rules; (7) Penalties; (8) Supplementary Rules. Cabinet orders and ministerial rules on the enforcement of The Air Pollution Control Act and other related statutes are also included.

K-5767

NEW PUBLIC HEALTH REGULATIONS GOVERNING THE DESIGN AND OPERATION OF HIGH-LEVEL ISOTOPE FACILITIES. Soviet J. At. Energy (English translation), 18(4):566-568, April 1965.

The chief public health and epidemiological control board of the Ministry of Public Health of the USSR has elaborated and adopted for 1964 some new public health regulations. These new regulations take into account the experience acquired in the operation of radiation facilities throughout the Soviet Union in recent years, and are based on the need to guarantee safety in work on isotope gamma-ray facilities with proper attention to the critical tolerance levels of external radiation. Specifications for intake and exhaust ventilation designed to lower the concentration of toxic substances gaining access to the personnel working room from irradiated objects, and also to remove ozone and nitrogen oxides formed as a result of ionization of the air, are listed. In order to avert any possible contamination in the rooms housing the radiation facilities, specifications are provided for coating the walls and ceilings of the irradiation rooms with low-sorption and readily deactivated materials, and for covering the floors with linoleum or PVC laminates. The introduction of these new regulations will eliminate some persisting uncertainties in the design and operation of high-level isotope gamma-radiation facilities, and lays down clear requirements adapted to modern concepts on the effects of gamma-radiation on the organism, so that this publication will contribute to a more widespread and safer use of radiation facilities.

K-6967

PREVENTION OF AIR POLLUTION IN THE STATE OF NORTH RHINE-WESTPHALIA. Translated from German. Ministry of Labour and Social Welfare, North Rhine-Westphalia, Germany, 78p. (Report to the Congress on the "Prevention of Air Pollution", Duesseldorf, Germany, April 5-7, 1965.)

A survey of the activities in North Rhine-Westphalia for the prevention of air pollution is reported and the results are summarized. The report included: (1) history, legal basis, administrative organization, smogwarning network, and economic problems; (2) report of the Factory Inspection Dept. (Enterprises subject to approval and other enterprises and working places); and (3) report of the State Institute for Air Pollution Control and Land Utilization (monitoring of air pollution, techniques for measuring immissions, relationship between emission and immission, technical steps for the restriction of emissions, and the effect of air pollution on soil, vegetation and animals).

K-8194

Kalyuzhnyi, D. N., Ya. I. Kostoveskii, S. A. Davydov and M. B. Aksel'rod
EFFECTIVENESS OF SANITARY CLEARANCE ZONES BETWEEN INDUSTRIAL ENTERPRISES AND RESIDENTIAL QUARTERS. Gigiena i Sanit., No. 4, p. 9-12, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 179-183, Aug. 1960.
CFSTI: TT 60-21913

Results of atmospheric air studies in the vicinity of chemical and metallurgical plants demonstrated that dust, sulfur dioxide, hydrogen sulfide and nitric oxide were absorbed from polluted air by suitable types of plant life to a considerable degree. It is recommended that, in creating intervening sanitary clearance zones, provisions should be made for planting suitable trees and other types of plant life.

K-8195

Kalyuzhnyi, D. N. and Ya. I. Kostovetskii
PLANNING AND EFFECTING SANITARY CLEARANCE ZONES IN THE UKRAINE. Gigiena i Sanit., No. 7, p. 9-12, 1952. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 183-186, Aug. 1960.
CFSTI: TT 60-21913

Examination revealed that the sanitary clearance zones surrounding industrial establishments, in the majority of cases, were planted with trees, shrubs and bushes which protected the population from the deleterious effects of industrial discharges. Establishing sanitary clearance zones is an important sanitary measure; they should be appropriately developed by planning organizations. Architects and builders should plan for the best type of the sanitary clearance zones with regards to planting fruit trees, berries, shrubs, vegetable gardens, decorative plants, and water reservoirs. Only in this way will sanitary clearance zones between residential sections and the sources of air pollution become economically sound.

K-8786

Kaspar, J., B. Petr and P. Schmidt
SCHEME FOR INVESTIGATING THE EFFECT OF ATMOSPHERIC POLLUTION ON THE POPULATION'S HEALTH. [Škhema issledovaniya vliyaniya zagryaznennogo atmosfernogo vozdukha na sostoyanie zdorov'ya naseleniya.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(7-9):420-424, July-Sept. 1967. 10 refs.
CFSTI: TT 67-51409/3

Based on experience and on the literature, a scheme consisting of definite methods for investigating the effects of atmospheric pollution on health is presented. General characteristics of the investigated territory, and studies of the health condition of children residing in the investigated regions by the method of group diagnosis are discussed.

K-9269

Schwegler, Hans
AIR POLLUTION CONTROL IN MUNICH. Staub (English translation), 27(10):1-7, Oct. 1967.
CFSTI: TT 67-51408/10

The municipal authorities at Munich have been active in the field of air pollution control since 1948. In the case of measurements carried out during heating periods, very high SO_2 concentrations were found which, to a large extent, were due to steady weather conditions frequently prevailing at Munich. At present, SO_2 concentrations and partly also dust fall and meteorological data are measured at 7 permanent measuring stations and 64 random sampling points. The permanent measuring stations are connected to a fully automatic center in which the measured values are assessed. The results are evaluated by computers. As a result of the unfavorable meteorological position of Munich the measures for improving air quality are particularly strict. (Author's summary)

L-5117

Ryazanov, V. A.
ABOUT THE CRITERIA FOR EVALUATION OF EFFECTS OF ATMOSPHERIC POLLUTANTS AT LOW CONCENTRATIONS UPON AN ORGANISM. Translated from Russian. Gigiena i Sanit., 26(6):3-7, June 1961.

The first attempt to develop maximum allowable concentrations of air pollutants has been undertaken by the Soviet hygienists. As a basis for this work the criteria were used which were first published in 1949 and which did not meet with any objections in the scientific literature. These criteria, in essence, are as follows: (1) "An allowable concentration" could be only such concentration of any substance in ambient air, which does not affect a man directly or indirectly by producing a detrimental or unpleasant effect, does not lower his working capacity, and does not affect his mood or sense of well-being; (2) The necessity of acclimatization to the toxic substances should be looked upon as an adverse condition and a proof of intolerable concentration; and (3) The "intolerable concentrations" are also such concentrations of toxic substances, which have a damaging effect upon vegetation, climate of a location, visibility or customary conditions of life of the residents. Therefore, during the investigations in regard to hygienic regulation of atmospheric pollution, special attention has been paid to a threshold of odors. These investigations, however, showed that an absence of odor perception does not indicate that under the influence of an action of unperceived concentration there is no occurrence in an organism of some reflex reactions with the receptors of the respiratory system. As a rule, the higher concentrations of odoriferous gases cause a decrease in light sensitivity, while the lower concentrations increase it. These changes were interpreted in regard to relationship between nerve centers. When, under an influence of weak odor, a process of excitation takes place in a sensory center it reaches the visual region by way of irradiation over the brain cortex and induces an increase in light sensitivity. If an odor is strong, an excitation which appears in olfactory center, according to a law of negative induction, causes an inhibition of the visual region of the cortex and as a result its light sensitivity is reduced.

L-5940

Ryazanov, V. A.
NEW DATA ON LIMITS OF ALLOWABLE ATMOSPHERIC AIR POLLUTANTS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 6. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VI.] V. A. Ryazanova (ed.). Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 1), p. 1-8, 1962.
CFSTI: TT 64-11574

This volume contains material discussed by the Committee on Sanitary Air Protection during its 1959 and 1960 sessions. The material contained in this volume is of heterogenous character in its methodological presentations and completeness and finality of the reports. The Committee took the position that the level of methodology reached during the last period of investigation and the degree of reliability of results obtained did not represent the acme of perfection, and therefore, the proposed limits of allowable concentrations should be regarded as more points of orientation for future studies, leading to more basic, more scientific and hence, more reliable limits of atmospheric air pollutants. In this connection it is the aim and purpose of this Committee to act as the stimulator, guide and directing agent leading into investigational channels based on the outlined principles. Air pollutants studied include formaldehyde, HCl aerosol, CS_2 vapor, Mn, Hg, combined Cl_2 and HCl gas, acetone, CO and Dinyl (mixture of diphenyl and diphenyl oxide).

L-5952

Ryazanov, V. A.
A SUMMARY OF 1961 STUDIES IN THE FIELD OF LIMITS OF ALLOWABLE CONCENTRATIONS OF ATMOSPHERIC AIR POLLUTANTS. In: Limits of Allowable Concentrations of Atmospheric Pollutants, Book 7. [Predel'no Dopustimye Kontsentratsii Atmosfernykh Zagryaznenii, Vypusk VII.] V. A. Ryazanova (ed.). Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 9 (Part 2), p. 138-141, 1963.
CFSTI: TT 64-11574

The Committee for the Sanitary Protection of Atmospheric Air approved limits of allowable concentrations in the air for the following new substances: furfurol, dimethylformamide and styrol. Furfurol is a heterocyclic aldehyde which is a good solvent for many organic substances used in the preparation of some plastics and a selective solvent for the purification of crude oil lubricants. The threshold of aldehyde odor perception in most sensitive persons was established at 1 mg/m^3. It was determined that 0.05 mg/m^3 of furfurol constituted the subthreshold concentration in all the tests employed. Therefore, 0.05 mg/m^3 of furfurol was accepted as the maximal single allowable concentration. Styrol is a benzene homologue with one double bond at its side chain. The maximal single allowable concentration of styrol in the atmospheric air was suggested as 0.003 mg/m^3. Dimethylformamide is a colorless liquid having a nauseating herring odor; it is used as a polyacrylnitryl solvent in the synthetic fiber industry known as orlon and nitron. It was recommended that 0.03 mg/m^3 be adopted as the limit of allowable single and 24 hour concentration of dimethylformamide vapor in the air, since it proved to be the subthreshold concentration in relation to all the test indexes. The limit of allowable phenol concentration in atmospheric air was set at 0.01 mg/m^3. Rats were exposed to the inhalation of nitrogen dioxide 6 hours daily for 164 days at different dose levels. No maximum allowable concentration was agreed upon.

L-6573

PERMISSIBLE CONCENTRATIONS OF NITROUS GASES. [Maximale Immissions-Konzentrationen (MIK) Nitrose Gase.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2105, 13p., Dec. 1962. 24 refs. (Presented at the National Conference on Air Pollution, Washington, D. C., Dec. 10-12, 1962.)

The VDI Specifications for Permissible Immission Concentrations (PIC) concern the determination of limit values for given types of air pollution. For purposes of comparison, the PIC-values are always confronted by the permissible work-place concentrations (PWC-value) of the respective gas, aerosol, or dust, i.e., the present limit value for the mean concentration of the substance in the respiratory air at the work-place per 8-hour shift. The information is outlined under the headings of: Occurrence of Nitrosylsulfuric Acid; Properties of Nitrous Gases; Effects of Nitrous Gases; and Exposure Limits.

L-6574

PERMISSIBLE IMMISSION CONCENTRATIONS OF CHLORINE GAS. [Maximale Immissions-Konzentrationen (MIK) Chlor.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2106, 14p., Sept. 1960. 13 refs.

The maximum exposure limits of chlorine gas, its effects on humans, animals, and plants are discussed. The tolerance limits for chlorine gas range from 0.3 mg/m^3 continuous exposure value to 3.0 mg/m^3 permissible work-station value as half-hour mean values.

L-6575

PERMISSIBLE IMMISSION CONCENTRATIONS OF SULPHUR DIOXIDE. [Maximale Immissions-Konzentrationen (MIK) Schwefeldioxyd.] Translated from German. Verein Deutscher Ingenieure-Richtlinien, No. 2108, 18p., Nov. 1961.

The maximum exposure limits of SO_2, its effects on humans, animals, and plants are discussed. The provisional tolerance limits for SO_2 are determined as half-hour mean values and range from 0.5 mg/m^3 (continuous exposure value) to 13.0 mg/m^3 (permissible work-station value).

L-6677

Khukrir, E. V.
MODERN APPROACH TO AIR DUSTINESS IN WORKSHOPS. Gigiena i Sanit., 24(7):50-55, 1959. 9 refs. Translated from Russian by B. S. Levine. U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 301-308, 1962.
CFSTI: TT 62-11103

Extensive data have been accumulated during recent years on the effect of different types of industrial aerosols. Based on the summary and evaluation of new data obtained from institutes, universities, and practicing physicians a list was prepared of the maximum permissible concentration of 55 dusts and aerosols. This list is presented and improvements in the standards are recommended.

L-6864

Shul'ga, T. M.
SUBSTANTIATING THE MAXIMUM PERMISSIBLE DAILY AVERAGE CONCENTRATION OF CARBON MONOXIDE IN THE ATMOSPHERIC AIR. [K obosnovaniyu predel'no dopustimoi srednesutochnoi kontsentratsii okisi ugleroda v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(4):1-5, April 1965. 5 refs.

To substantiate the maximum permissible daily average CO concentration of 1 mg/m^3 instead of 2 mg/m^3, an investigation was performed on three groups of rats. Two groups were subjected to CO in concentrations of about one and two mg/m^3 around the clock for two and a half months, and a control group was not exposed to CO. During the observation period there was no appreciable change in the activity of the animals and no significant difference was noted between the weight of the animals in the experimental groups and those in the control group. CO in an average concentration of 2.65 mg/m^3 under conditions of round-the-clock chronic poisoning for a period of two and a half months causes a certain change in porphyrin metabolism. CO in an average concentration of 1.13 mg/m^3 under the same conditions causes no change in the motor chronaxie or porphyrin metabolism of experimental animals and has no effect on the function of the hemopoietic system.

L-6865

Tsapko, V. G.
DETERMINATION OF THE MAXIMUM PERMISSIBLE CONCENTRATION OF CHLOROPHOS IN THE AIR OF THE WORK ZONE. [Materialy k gigienicheskomu normirovaniyu khlorofosa v vozdukhe rabochei zony.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(4): 35-40, April 1965. 4 refs.

A study of the toxic properties of phosphororganic pesticide chlorophos (Dipterex, Trichlorophon, Bayer L 13/59) in an experiment carried out on warm-blooded animals demonstrated that the compound, when penetrating into the body through the mucous membranes of the gastrointestinal tract and intact skin, had a less toxic effect than methylmercaptophos, metaphos and thiophos. The cumulative properties of chlorophos are insignificant. The maximum permissible concentration of chlorophos (in the form of vapor and liquid aerosol) in the air of the work zone is recommended to comprise 0.0005 mg/l (0.5 mg/m^3). (Author's summary)

L-6885

Gol'dberg, M. S.
HYGIENIC CRITERIA OF AIR PURITY IN POPULATED AREAS (ACCORDING TO MATERIALS OF THE GENEVA SYMPOSIUM). [O kriteriyakh gigienicheskoi otsenki chistoty atmosfernogo vozdukha naselemnykh' mest] [Po materialam Zhenevskogo simpoziuma] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(1):90-98, Jan. 1965.
CFSTI: TT 66-51033

In recent years there has been a steady increase in hygienic research on air in populated areas. The need for planning of measures for the control of atmospheric pollution is becoming increasingly urgent. The necessity for an international discussion of this subject, which would be a starting point for all measures undertaken for the sanitary protection of urban air, led the World Health Organization to convene an interregional symposium in Geneva from the 6th to the 12th of August, 1963, which was devoted to criteria for the quality of atmospheric air and methods of its investigation. The discussion was centered on the maximum permissible concentrations of harmful substances in urban air. After a lively discussion, the symposium adopted Prof. V. A. Ryazanov's proposal to establish a unified scale of standards for the quality of air by merging together the Soviet and American standards. In this way, an international scale for the atmospheric pollution has been established for the first time. The symposium drew up recommendations on the trend in medical research on the effect of atmospheric pollution on the health of the population, and a further elaboration of criteria and standards of atmospheric air quality in populated areas. Participants at the symposium also noted the necessity for the further development of scientific research on the mechanism of development of fibrotic pulmonary reaction induced by atmospheric pollutants, and for studies of the reaction of the mucosa of the respiratory tract, ciliary activity, etc. The symposium pointed out the necessity for paying special attention to studies of new synthetic chemicals which contaminate the atmosphere when discharged by industrial enterprises or when used in the household, as in the case of disinfectants.

L-6901

Kristesashvili, Ts. S.
THE MAXIMUM PERMISSIBLE CONCENTRATION OF PYRIDINE IN THE AIR. [Materialy k obosnovaniyu predel'no dopustimoi kontsentratsii piridina v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(11):173-177, Nov. 1965. 4 refs.

Long term effects and the maximum permissible concentration of pyridine were determined. The threshold value of smell of pyridine for the most sensitive persons proved to be at a level of 0.21 mg/m^3; the imperceptible concentration amounted to 0.084 mg/m^3. The threshold of reflex action of its vapors equalled to 0.098 mg/m^3, the ineffective concentration - 0.079 mg/m^3. A chronic 24-hour poisoning with it at a concentration of 1 mg/m^3 for a period of 2 months produced in experimental rats changes of the chronaxie relationship of the flexors and extensors, that of the cholinesterase activity and the blood protein fraction. Pyridine at a concentration of 0.1 mg/m^3 had no effect on the rats. The maximum one-time and the daily average maximum permissible concentration of pyridine in the atmosphere is recommended to be at a level of 0.08 mg/m^3.

L-7215

Brasser, L. J., P. E. Joosting and D. van Zuilen
SULPHUR DIOXIDE - TO WHAT LEVEL IS IT ACCEPTABLE? Translated from Dutch by Inst. Voor Gezondheidstechniek TNO. (Res. Inst. for Pub. Health Eng.). Rept. G-300, 67p., July 1967. 97 refs.

A Dutch air quality guide or standard for SO_2 is wanting. An outline is given of how an air quality guide or standard should be formulated so as to be operable and controllable. In practice, air pollutant concentrations are nearly always inconsistent as a result of varying production and changing meteorological conditions. Consequently, series of air pollution measurements should be performed in such a way that the results (a) can be considered representative, and (b) can be reproduced and interpreted easily. A summarizing survey is given of the effects of SO_2 and of complex pollutants that can be characterized by SO_2. On the basis of these data, threshold limit values have been formulated taking the line that harmful or detrimental effects, which reasonably can be expected, should be prevented. The terms and criteria used are in accordance with generally accepted desiderata for the formulation of guides and standards.

L-7289

Isaev, N. S., Z. B. Smelyanskii, L. K. Khotsyanov and E. V. Khukhrin
PROPOSED NEW SANITARY STANDARDS FOR PROJECTED INDUSTRIAL PRODUCTION PLANTS. Gigiena Truda Prof. Zabolevaniya, 1(4):3-11, 1957;* Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 2, p. 37-47, March 1960.
CFSTI: TT 60-21188

New "Construction Standards and Regulations" are now in the process of development; simultaneously the sanitary standards for the planned industrial enterprises are also being revised. The earliest sanitary standards regulating the construction of proposed industrial enterprises were issued in 1939. The new revision of the sanitary standards is the sixth in order of legally enacted documents in the field of industrial hygiene. In developing the proposed meteorological standards the position was taken that in all production and manufacturing plans temperature, humidity and air currents must be regulated in a synchronized manner. In the meteorological standards now in existence these factors are in a sense independent of one another; this caused the practicing sanitary-physician considerable difficulty in the enforcement of the prescribed standards for work rooms and shops in which heat and humidity were constantly liberated. Tables are presented showing temperature, humidity and air current standards for work rooms in manufacturing and production industries, meteorological standards of air ventilation, temperature and air current velocity. Also tabulated are maximum allowable concentrations of poisonous gases, vapors and aerosols in the air of work rooms and shops of industrial manufacturing and production plants.

L-7471

Fel'dman, Yu. G.
THE EXPERIMENTAL DETERMINATION OF THE MAXIMUM PERMISSIBLE ONE-TIME CONCENTRATION OF DIKETENE IN THE ATMOSPHERE. [K obosnovaniyu maksimal'noi razovoi predel'no dopustimoi kontsentratsii diketenna v atmosfernom vozdukhe.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(1):9-14, Jan. 1967. 5 refs.
CFSTI: TT 67-51409/1

In order to establish the maximum one-time permissible concentration of diketene in the external air, its olfactory threshold was determined. Observations were carried out on 20 subjects, aged 16 to 41. A total of 833 determinations were made on seven different concentrations of diketene, ranging from 3.333 to 0.011 mg/m^3. The diketene in the air was determined by the fluorimetric method. The sensitivity of this method is 0.01 µg per ml of analyzed solution. The olfactory threshold for diketene was found to be 0.019 mg/m^3 in the most sensitive subjects, the threshold for the reflex effect on the ocular sensitivity to light was 0.011 mg/m^3, and the threshold for the establishment of a conditioned electrocortical reflex was found to be 0.01 mg/m^3. Subliminal concentrations for these tests were 0.011, 0.009, and 0.007 mg/m^3 respectively. The recommended maximum permissible one-time concentration of diketene in the atmosphere is 0.007 mg/m^3.

L-7576

Shakbazyan, G. Kh. and I. M. Trakhtenberg
HYGIENIC STANDARDS AND SAFETY CRITERIA FOR ENVIRONMENTAL FACTORS IN INDUSTRY. [O gigienicheskom normirovanii i kriteriyakh bezurednosti faktorov proizvodstvennoi sredy.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 30(9):328-226, Sept. 1965. 15 refs.
CFSTI: TT 66-51033/3

The principles governing the determination of hygienic standards for the factors of industrial environment are discussed. The necessity of differential substantiation of hygienic standards for various factors closely related to the everyday life of man and for factors whose action is undesirable and harmful in the environment of man is also discussed. On the basis of the work done at the Occupational Hygiene Department of the Kiev Medical Institute, certain data are presented on the criteria that may evaluate the harm and safety of the investigated effects. Interpretation of the experimental findings on the effect of toxic substances of the immunobiological reactivity, the protein metabolism and the cardiac functioning is given. The relationship of specific and non-specific reactions of the body in reply to the action of toxic substances is analyzed.

L-8193

Gol'dberg, M. S.
THE SANITARY CLASSIFICATION OF INDUSTRIAL PLANTS AND SANITARY CLEARANCE ZONES. Sanitary Protection of Air, Moscow, Suppl. or App. Nos. 3 & 4, p. 119-131, 1948. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 165-178, Aug. 1960.
CFSTI: TT 60-21913

Industries were broken down into groups such as chemical manufacturing, mining, and metallurgical. Each group is divided into classes dependent upon the size of the sanitary clearance zone which is required. These zones represent areas which are thickly planted with trees and other plant life as an aid in the control of air pollution. The present classification appeared in 1948 and has since been superseded. An appendix lists maximum allowable concentrations for approximately 60 chemical compounds.

L-8211

Hildenskiold, R. S.
LIMITS OF ALLOWABLE CONCENTRATION OF CARBON BISULFIDE IN THE ATMOSPHERIC AIR OF RESIDENTIAL AREAS. Gigiena i. Sanit., 24(6):3-8, 1959. 8 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 5, p. 46-52, Jan. 1961.
CFSTI: TT 61-11149

The zonal distribution of atmospheric air pollution with carbon bisulfide by an artificial viscose fiber combine at distances of 150, 500, 1000, 1500, 2000, 2500 and 3000 m was investigated. The hygienic significance of carbon bisulfide concentrations found in the atmospheric air was also evaluated using the methods of CS_2 odor threshold perception and of threshold reflex effect on the functional state of the cerebral cortex, as indicated by changes in optical chronaxy and in adaptation to darkness. The carbon bisulfide odor perception threshold for highly sensitive persons was 0.05 mg/m^3; the non-perceptive (sub-threshold) concentration was 0.04 mg/m^3. The threshold of carbon bisulfide reflex effect, determined by optical chronaxy measurements, was 0.04 mg/m^3. The sub-threshold concentration was 0.03 mg/m^3. The threshold of CS_2 reflex effect on the functional state of the cerebral cortex, as determined by the adaptometric method, was on the same level of 0.04 mg/m^3. On the basis of the results, it was suggested that 0.03 mg/m^3 be adopted as the maximum permissible single carbon bisulfide concentration in atmospheric air of residential districts, because it was below the threshold of odor perception and of reflex effects. Results of laboratory tests conducted with human subjects, and of field pollution surveys conducted at different distant zones from the viscose fiber plant, led to the conclusion that a sanitary clearance (or protection) zone 2000 meters wide must be instituted around the artificial viscose fiber plant, which daily discharged into the atmosphere 4 tons of carbon bisulfide. In the absence of purifying installations, the sanitary clearance zones should be not less than 3000 m wide.

M-4155

Reshetov, V. D.
AEROSOL ORIGIN OF ATMOSPHERIC OZONE (A HYPOTHESIS). In: Part 1 - Atmospheric Ozone. Results of U.S.S.R. International Geophysical Year Studies Presented at the Oct. 28-31, 1959 Conference. Reports and Resolutions, 1961. 18 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 73-85, 1966.
CFSTI: TT 66-62191

The modern theory of the origin of photochemical atmospheric ozone fails to explain some facts and ozone properties. For instance, in the south, where ultraviolet radiation is greater the amount of ozone is smaller than in northern regions, where radiation arrival is considerably less, and during the polar night is nonexistent. It also fails to explain annual changes in ozone content with a maximum at the end of winter and beginning of spring, and high ozone content in the lower portion of the stratosphere and troposphere, since that portion of ultraviolet radiation, which generates atomic oxygen, is absorbed totally above the 20-km level. It is also difficult to explain the appearance of special ozone maximum observed sometimes in the tropopause, or the considerable fluctuations in ozone content associated with weather conditions. It is conceivable that atmospheric ozone is also generated under the effect of other factors, which, in a number of cases, may be highly important. A hypothesis is presented on the generation of atmospheric ozone by atmospheric aerosols from water and atmospheric oxygen during selective sorption and desorption at the aerosol surface.

M-4171

Rozental', O. M.
STRUCTURAL OZONE MOLECULE MODELS. In: Part 2 - Atmospheric Ozone. Data Presented at the May 21-23, 1963 Conference on Atmospheric Ozone, 1965. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 13, p. 225-229, 1966.
CFSTI: TT 66-62191

A clear concept of the ozone molecule structure might advance the solution of the atmospheric ozone problem. Four configurations of atomic centers had been proposed in the past for the ozone molecule, each of a different symmetrical type. The inconsistencies of each proposed model are brought out in this report and proof is offered in favor of an absolutely asymmetric model, the kind of which had not been considered before. Proof of the acceptability of an asymmetric model amounts to a strictly numerical calculation procedure which involves analysis of the infrared ozone spectrum, study of the energy levels in the case of an assumed motion of the third atom, and accurate determination of dynamic coefficients.

M-4556

Swinarski, A. and J. Siedlewski
INFLUENCE OF ADSORBED OXYGEN ON THE CATALYTIC PROPERTIES OF ACTIVATED CARBON. [Wplyw Adsorbowanego Tlenu Na Wlasnosci Katalityczne Wegla Aktywowanego.] Translated from Polish. Roczinki Chemii, No. 35, p. 999-1008, 1961. 33 refs.

The catalytic properties of activated carbon in the H_2S oxidation reaction were studied and compared with the results obtained by using carbon previously desorbed and saturated with oxygen after desorption. The composition of oxidation products and the effect of moisture content on this composition were determined. Comparison of the available information on oxygen adsorption on carbon pores with the results obtained in the present work indicates that the prevailing views can be supplemented with a working hypothesis which would require comprehensive confirmation. Prior to being used as a catalyst for H_2S oxidation, carbon adsorbs oxygen in its pores, which in part is bound irreversibly in the form of $C_{(x)}O_{(y)}$ surface complexes. The amount of the resultant complexes depends on the oxygen concentration in the gas surrounding the carbon. The oxygen contained in the gas from which H_2S is being removed is adsorbed on carbon reversibly. It undergoes instant activation, which increases with time. The degree of this activation depends on the amount of surface $C_{(x)}O_{(y)}$ complexes formed on the catalyst pore surfaces. These complexes have varying stability, and strong desorption at 450 C causes most of them to be decomposed. The oxidation of $S_2^{(-)}$ to $S_4^{(+)}$ in accordance with the scheme, $2H_2S + 3O_2 = 2SO_2 + 2H_2O$, depends not only on the $H_2S:O_2$ ratio in the reaction mixture, but is greatly affected by the moisture content of the medium, a circumstance mentioned by Corty. The assumption that complete oxidation of H_2S proceeds through combined reactions and $2SO_2 + 4H_2S = 6S + 4H_2O$ constitutes a postulate which goes further than Prettre's assumptions. These conclusions derive both from an analysis of previous results and from the fact that at $H_2S:O_2 = 1:0 \cdot 625$ oxygen-containing sulfur compounds are obtained in the reaction products. This ratio is considerably lower than that predicted by Prettre.

M-5262

Shifrin, K. S., A. Ya. Perel'man and V. G. Bakhtiyarov
DETERMINATION OF THE PARTICLE SPECTRUM BY THE TRANSPARENCY METHOD FOR A LARGE PARTICLE CONCENTRATION. Giz. Atmosfery i Okeana, 27(7):762-765, 1966. 5 refs. Translated from Russian. Joint Publications Research Service, Washington, D. C., 6p., Sept. 15, 1966.
CFSTI: TT 66-34080

Plane models of sols were investigated. These consisted of suspensions of small spherical particles of AgBr in gelatin. The optical density of particle layers was measured at various wave lengths. Uniformity and incoherence of scattering were assumed in the dispersion systems studied at an increase in density to values greater than 700-800 x $10^5/cm^2$, agglomeration of the particles occurred. With a reduction in density to values smaller than 50 x $10^5/cm^2$, determination of spectral transparency became impossible. Equations are presented for the determination of particle spectrum from experimental values of spectral transparency.

M-5382

Krejcar, E.
ANION EXCHANGE RESINS AS SORBENTS OF SULFUR DIOXIDE. Translated from Czech. Chemicky Prumysl, 15(40):77-79, 1965. 6 refs.

The adsorption of sulfur dioxide on anion exchange resins made in Czechoslovakia was investigated in a dynamically arranged experiment; the adsorption was studied as a function of the time, water content of the resin, and flow rate. It was found that strongly basic anion exchangers of the styrene-divinylbenzene type, and the slightly basic polyamide anion resin with a high capacity at a relative humidity of 60 to 100 percent are suitable. Sulfur dioxide is adsorbed quantitatively up to the moment of saturation of the resin. The time it takes to saturate the resin is a function of the concentration of sulfur dioxide and of the flow rate of the gas. The strongly basic anion exchangers of the styrene-divinylbenzene type were also used successfully for the adsorption of hydrogen sulfide.

M-5782

Voloshchuk, V. M.
CRITICAL CONDITIONS OF INERTIAL SETTLING OF AEROSOLS FROM SYMMETRICAL FLOWS. Atmospheric and Oceanic Physics (English Translation), 1(12):757-762, Dec. 1965. 8 refs.

The problem of analytical determination of k_{er} for symmetrical flows is solved under certain limiting assumptions. The existence of critical conditions is proved, and it is shown approximately which part of the medium flowing around the obstacle plays the main role in establishing these conditions. A specific case of flow around a circular cylinder with Re less than 1 is considered. It is shown that for exact determination of k_{er} in the general case of symmetrical flows it is sufficient to know the values of the normal component of the aerosol velocity over a certain section of the axis of symmetry parallel to the axis of unperturbed flow. A system of algebraic equations for exact determination of k_{er} is given. (Author's abstract)

M-6625

Ruey-Shen, Tsay
A DISCUSSION OF THE FORMULA USED IN COMPUTING THE AMOUNT OF FUEL REQUIRED TO PRODUCE GASES AT A GIVEN TEMPERATURE IN A COMBUSTION CHAMBER OR AFTERBURNER. Chi Hsieh Kung Ch'eng Hsueh Pao, 12(3):94-96, 1964. Translated from Chinese. Foreign Technology Division, Air Force Systems Command, Wright-Patterson AFB, Ohio, 4p., Oct. 25, 1965.

A generalization of 2 formulas for calculating the amount of fuel required to produce combustion gases at a given temperature in a combustion chamber or in an afterburner is presented. The applicability of the original formula based on $(CH_3)_m$ fuel to other fuels is discussed.

M-6648

Matsak, V. G.
VAPOR TENSION AND VAPORIZATION OF SUBSTANCES IN MOVING AIR. Gigiena i Sanit., No. 8, p. 35-41, 1957. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 1-9.
CFSTI: TT 62-11103

The purpose is to place at the disposal of engineers and hygienists working in the field of sanitary technology basic data regarding vapor tension and rate of vaporization of different inorganic and organic substances in moving air. Particular emphasis is placed on substances, and especially toxic substances, most commonly used in industrial technology. Such information should allow hygienists to evaluate the potential danger associated with vaporization of toxic substances in relation to their physico-chemical and toxicological properties, and sanitary engineers to apply it in their computation of air ventilation in general and of quantative determination of the degree of air charged with vapor of high-molecular substances, and in correctly distributing incoming and exhaust air, and in computing other means required for the sanitary improvement of labor conditions. It is suggested that sanitary engineers use the nomograms presented especially where a 5 percent error is permissible. More than 85 chemically pure substances are represented in three nomograms and two tables.

M-6649

Radushkevich, L. V.
DEPOSITION OF PARTICLES FROM A GAS STREAM ON AN ISOLATED CYLINDER (THEORETICAL). Zh. Fiz. Khim., 32(2):282-290, 1958. 11 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 7, p. 10-21, 1962.
CFSTI: TT 62-11103

The effect on deposition of two factors, diffusion and direct interception is analyzed; this is in accord with the simplest process of filtration of highly dispersed aerosols where the inertia and sedimentation deposition factors can be disregarded. The primary purpose was the determination of the relation between *filtration effectiveness and the size of* aerosol particles. A theory of particle deposition from an aerosol flow upon an isolated cylinder may be formed by regarding the phenomenon as a special class of the orthokinetic coagulation of polydispersed sols in a state of flow. A similar theory of spherical particles coagulation was developed by Miller (1928), who studied the motions of coarse aerosol particles suspended among fine particles. An analogous mechanism is in operation in the case of aerosol particle deposition on a stationary obstruction, such as a cylinder, which acts as an adsorption body. This analysis was made with the aid of the convection diffusion differential equation; it indicated that deposition effectiveness was a function of particle size cylinder radius (or diameter) and of the linear flow velocity. In instances of particles of finite geometric dimensions the total process can be described as a simultaneous effect of diffusion and of direct interception. Deposition effectiveness as a function of particle radii has its minimum in the instance of any flow in the presence of a small Reynolds number and a moderate r/R ratio; this is in agreement with most experimental data obtained in the study of aerosol filtration.

M-7474

Labounkova, A. and Z. Hostalek
AN APPARATUS FOR THE EXPOSURE OF SMALL LABORATORY ANIMALS TO LOW CONCENTRATIONS OF SULFUR DIOXIDE. [Ustanovka dlya zatravki melkikh labora-tornykh zhivotnykh nizkimi kontsentratsiyami sernistogo gaza.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(1):101-107, Jan. 1967. 2 refs.
CFSTI: TT 67-51409/1

An apparatus was designed for the continuous exposure of 80 rats (60 test and 20 control animals) over a period of 6 months, to three different concentrations of sulfur dioxide. The design was based on the need to provide the following optimum environmental conditions for the rats: volume, 2.29 to 16.48 dm^3 per animal; air temperature 18-21°; velocity of air movement, 0.2 m/sec; 10 to 15 air changes in the chamber per hour; floor space, 3.25 dm^2 per 300g rat (Lanne-Petter); relative humidity, 45 to 60 percent; noise, not exceeding 40 db; temperature gradient between the entrance and exit of the chamber, maximum of ± 8°; illumination, 8 to 10 watt/m^2. Other important factors were the maintenance of constant conditions within the chamber, including a daily supply of fresh water and food; rapid servicing; emergency ventilation in the case of failure of the air supply equipment; and intake of pure air, and identical conditions for the test and control animals. The apparatus consists of four horizontal gas chambers; a device for supplying conditioned air to the chambers; a dosing device for the supply of a given concentration of SO_2 to the chamber; and a device for automatically recording the SO_2 concentration in the chambers. In order to save floor space, the chambers are arranged vertically, one above the other, each chamber being designed to accommodate 20 rats. The dosing device was designed especially for SO_2, but it can also be used for experiments with other gases.

M-7495

Ciborowski, J. and R. Pohorecki
THE EFFECT OF ELECTRICAL DISCHARGES ON SUBLIMATION CONDENSATION. Chem. Stosowana, Vol. 2B, p. 159-182, 1966. 46 refs. Translated from Polish. Int. Chem. Eng., 7(1):4859, Jan. 1967.

The effect of electrical discharges on the condensation of vapor at temperatures below the triple point has been studied. A simplified schematic diagram of the apparatus used is presented. It was composed basically of a saturator, a heater, a superheater, an ionizer, and a condensation chamber. The condensation was carried out by mixing a hot stream of gas containing vapors of the condensing component (naphthalene) with a stream of cold inert gas. It was concluded that: the existence of a considerable effect of electrical discharges on the course of sublimation condensation has been established. This effect is based primarily on intensification and simultaneous stabilization of the course of the progress. The effect of discharges on the condensation process depends on the type of discharge. This effect is considerable in the case of spark discharges, but in the case of corona discharges it was not observed at all. The magnitude of the effect observed depends to a small degree on the voltage (if it is large enough for spark discharges to occur). This magnitude also depends on the thermodynamic parameters of the system; however, no dependence on the flow rate of the gas through the ionizer was observed (within the investigated limits of changes of this value). The effects of electrical discharges on the condensation process can be explained by the formation of a larger number of active condensation nuclei, which facilitate nucleation of the new phase.

M-7515

Siedlewski, J. and S. Trawinski
THE MECHANISM OF CATALYTIC OXIDATION ON ACTIVATED CARBON. VIII. THE RELATIONSHIP BETWEEN THE CONCENTRATION OF FREE RADICALS OF CARBON AND ITS CATALYTIC ACTIVITY IN THE OXIDATION OF H_2S AND SO_2. Roczniki Chem., No. 6, p. 1083-1090, 1966. 18 refs. Translated from Polish in Intern. Chem. Eng., 7(1):35-39, Jan. 1967.

The concentration of free radicals in carbons obtained as a result of the carbonization of organic substances depends on the carbonization temperature. A maximum number is obtained in the temperature range of 550 - 700°, depending on the type of substance carbonized. The number reaches 10^{20} free radicals per gram. At a temperature of about 1200° their number diminishes by two orders of magnitude. The catalytic activity of semiconductors, which include low-temperature carbons (obtained at temperatures below 900°), depends on, among others, the crystal structure and the electric conductivity. In the range of temperatures in which there is a variation of the concentrations of free radicals in low-temperature carbons, the crystal structure and the electric conductivity vary simultaneously. The catalytic activity of those carbons can depend on the variation of both of these parameters. The oxidation of H_2S and SO_2 on samples of carbon obtained as a result of carbonization of saccharose at a temperature of 1200° and of activation with oxygen at temperatures of 450° and 850° indicates that those carbons had a similar crystal structure, the same electric conductivity, and identical concentrations of free radicals. They differed only in the number of superficial oxides formed on their surfaces as a result of chemical activation by oxygen. The purpose of the present work was to find the connection between the concentration of free radicals in carbon and its catalytic activity in the oxidation of H_2S and SO_2. The number of micro moles of oxidation product forming per $m.^2$ of surface of the carbon in a specific time is taken as a measure of catalytic activity. The heating of carbon with previously formed free radicals causes a reduction in the number of radical active centers on the surface and a decline of its activity in the oxidation of H_2S and SO_2.

M-7618

Yantovskii, S. A., I. Yu. Sidorina, and M. V. Chernyak
CONDITIONS OF SAFE OXIDATION OF TOLUENE BY ATMOSPHERIC OXYGEN. Neftekhimiya, 6(1):105-111, 1966. 22 refs. Translated from Russian. Intern. Chem. Eng., 7(1):144-149, Jan. 1967.

The maximum permissible amount of oxygen and the limiting temperature to assure safe conditions for the liquid-phase oxidation of toluene at pressures from 1 to 20 atmospheres was determined. In order to assure safe conditions for the liquid-phase oxidation of toluene on an industrial scale it is necessary to maintain minimum oxygen concentration after the reactor at about 6 percent. In order to maintain a constant safe concentration of the toluene + air mixture in the reactor, in which the amount of oxygen can be brought up to 21 percent, it is necessary to maintain the temperature above the limiting temperature. At 10 atm. the temperature of the reactor should not be less than 130°. This value is 35 to 45° below the oxidation temperature of toluene, which is recommended for the optimum conditions.

M-7581

Rumpf, Hans
THE PROPERTIES OF USEFUL DUSTS. STAUB (English translation), 27(1):3-15, Jan. 1967. 20 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

Products in powder form have definite properties which should take effect during the utilization of these products. These product properties and the behavior of products during specific treatment processes depend on fineness properties and dispersion properties which are directly affected in the case of dust recovery. These dispersion properties are, for instance, size and shape of particles, physical and chemical structure of particles and of their surface, distribution of these properties in the whole mass of pulverulent material and the sum of definite particle properties, such as specific surface. It is of decisive importance for the utilization of dusts to know the relationship between product properties and fineness properties. A survey of the main relationships between these properties is given. (Author's summary)

M-7582

Schneider, Ulrich
THE GRINDING PROPERTIES OF THE STARTING MATERIALS FOR USEFUL DUSTS. STAUB (English translation), 27(1):16-24, Jan. 1967. 30 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

The most important grinding properties, such as, grinding capacity, grinding capacity limit, agglomeration behavior, particle shape, particle size distribution, structural changes, and chemical activation of the material to be ground are investigated as a function of different material properties and of the grinding method and grinding atmosphere. Material properties may be divided into absolutely important properties, and those which are only important in connection with the method of mechanical treatment and with the effect of grinding atmosphere. An analysis of grinding properties is extremely difficult because of the variety and multiplicity of factors influencing these properties. (Author's summary)

M-7583

Pietsch, Wolfgang
THE AGGLOMERATIVE BEHAVIOR OF FINE PARTICLES. STAUB (English translation), 27(1):24-41, Jan. 1967. 108 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

In the production and industrial treatment of fine dust, a more or less pronounced tendency to agglomeration always occurs which, although sometimes advantageous, is in most cases undesirable. To form agglomerates, adhesion forces must act between the individual dust particles. A survey of different bonding mechanisms is given and the significance of the individual magnitudes for desirable and undesirable agglomeration of fine particles is discussed. Finally, the great importance of agglomeration in the production and industrial treatment of fine dust is shown in a series of examples. Methods are described for reducing undesirable agglomeration phenomena and for increasing adhesion forces in the case of desirable agglomeration. (Author's summary)

M-7584

Gerth, Gerhard
FINE AND ULTRAFINE COMMINUTION IN THE MANUFACTURE OF USEFUL DUSTS. STAUB (English translation), 27(1):42-45, Jan. 1967. 3 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.
CFSTI: TT 67-51408/1

In the production of useful dusts, the comminution is carried out in three stages: coarse grinding, medium grinding, and fine or very fine grinding. In recent times special grinding machines have also been developed for very fine grinding, that is, ball mills and special impact mills. The design and field of application of these mills are discussed. The suitable operating method in the production of useful dusts, and raw material factors (such as moisture content, viscosity, splittability) influencing the grinding result, are investigated. (Author's summary)

M-7587

Gommel, Günter
ENERGY, ABRASION AND COMMINUTION IN IMPACT PROCESSES. STAUB (English translation), 27(1):54-61, Jan. 1967. 15 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part I, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/1

Tests were carried out to determine the relationship between abrasion and comminution in impact processes. The portion of the total impact energy which is due to impact partners according to their hardness, deformability, and fracture was demonstrated. Hardness of mineral impact bodies was between 120 and 2700 kp/mm^2 (HV equals 0.1), of metal impact bodies between 200 and 790 kp/mm^2 (HV equals 0.5), and that of steel plates exposed to impact was 725 kp/mm^2 (HV equals 10). Impact velocity was between 45 and 70 m/sec. (Author's summary)

M-7588

Stockburger, D.
FUNDAMENTALS OF DUST DRYING. STAUB (English translation), 27(2):1-5, Feb. 1967. 4 refs. (Presented at the the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part II, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/2

Drying of materials in powder form is sometimes undertaken to obtain specific material properties. More frequently the drying of pulverulent materials is carried out for plant engineering reasons. Convection dryers must, in the first place, be considered as dust dryers; the principle of these dryers is outlined on the basis of experience gained with bodies having capillary pores. The drying of dust mainly occurs in the first drying phase. The relationship between drying rate and different factors is also discussed. It is shown qualitatively how drying temperatures are limited in the case of products sensitive to temperature. (Author's summary)

M-7589

Baunack, Fritz
DRYING OF USEFUL DUSTS. STAUB (English translation), 27(2):6-10, Feb. 1967. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part II, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/2

The drying of useful dusts on an industrial scale has been developed from the drying of coal to be used in coal dust furnaces. Distinction is made between short-time and long-time drying. The most important drying methods used in industry, and their problems are discussed. It is shown, in particular, that special requirements with regard to dust removal from gas are associated with dust drying. It is always a special problem how to feed the wet raw material to the dryer in a controllable and uniform way. To solve this problem a close collaboration between the designer and user of the dryer is necessary. (Author's summary)

M-7590

Pietsch, Wolfgang
THE INFLUENCE OF ENCRUSTATION UPON THE DRYING OF POROUS CAPILLARY BODIES. STAUB (English translation), 27(2):10-11, Feb. 1967. 5 refs. (Presented at the Joint Convention of the Association of German Engineers, Working Group Dust Technology, and of the Swiss Association of Engineers and Architects, on "Useful Dusts, Their Manufacture and Technical Process" Part II, Basel, Switzerland, June 6-8, 1966.)
CFSTI: TT 67-51408/2

The main problem in drying useful dust is to cause no harm to the material. Damage by heating while drying fine powders is generally avoidable. This conclusion is correct when the individual particles of a bulk pile moistened by a pure liquid are insoluble. However, if the liquid contains substances precipitated or crystallized during drying - either because the particles are soluble or because the liquid is a solution - conditions change fundamentally. When using a dilute solution a thin crust forms on the surface of the body after a short period. This crust offers a certain resistance to diffusion of the water vapor formed directly below it, so that the drying rate is reduced. Further drying is largely influenced by the permeability of the primary crust, so that a constant though lower drying rate will again be established and the drying period will be longer. The temperature of the material then rises. Damage increases with temperature and drying duration. The drying of industrial, heat-sensitive products is doubtful if based upon the idealized behavior during drying of glass spheres, quartz, or other insoluble particles in pure water.

M-7724

Kutscher, Waldemar and René Tomingas
INVESTIGATION ON THE DANGER OF SOOT, PARTICULARLY ITS CARCINOGENIC EFFECT. 3rd REPORT: IMPLANTATION TESTS OF SOOT AND AIRBORNE DUSTS IN RATS. STAUB (English translation), 27(4):34-37, April 1967. 4 refs.
CFSTI: TT 67-51408/4

In most cases, when soot is implanted under the skin of animals, it penetrates the epidermis shortly after implantation. However, it was found that in the case of rats subjected to graphite implantation, the number of eruptions was insignificant. During the investigation of the causes of this phenomenon a series of factors has been eliminated. The test results indicate that soot eruption is caused by a logical digestion disturbance depending on the implanted substance which leads to an inflammation. (Author's summary, modified)

M-8180

Plit, I. G. and K. N. Shishkin
CARBON DIOXIDE ABSORPTION BY POTASH SOLUTION FOAM. Zh. Prikl. Khim., 29(10):1323-1329, 1956. 7 refs. Translated from Russian by B. S. Levine, U.S.S.R. Literature on Air Pollution and Related Occupational Diseases, No. 4, p. 60-68, Aug. 1960.
CFSTI: TT 60-21913

Experiments were carried out with the aid of an apparatus which enabled the study of absorption on the basis of individual bubbles and which made possible the computation of the contact surface of the phases. The apparatus consists of an absorption tube and the absorbent solution container. Simultaneously, a carbon dioxide - air mixture enters through a nozzle and foam bubbles are created in a weak saponin solution. The first set of experiments was devoted to the study of the effect of the surface-active admixture concentration upon the course of the absorption process and and 21.8 percent of carbon dioxide by volume and 150 g/l of K_2CO_3. The saponin concentration ranged from 0 to 4 g/l. In order to compare absorption rates, experiments were also conducted with K_2CO_3 solutions containing no saponin and 16 percent gas-air mixtures. Other parameters examined in the study included: the effect of absorbent solution concentration upon the absorption coefficient; and the effect of temperature upon the rate of absorption in the range of 14° to 20°C. The effects of these and other factors on the course of carbon dioxide absorption by discrete K_2CO_3 solution bubbles indicated that absorption by foam bubbles proceeded in accordance with special hydrodynamic conditions which lowered diffusion resistance and enhanced the kinetics of the process.

M-8262

Mackenzie, Robert C. and Robert Meldau
THE MORPHOLOGY OF FINELY-PARTICULATE OXIDES AND HYDROXIDES OF IRON, ALUMINUM, AND MANGANESE. STAUB (English translation), 27(5):19-29, May 1967. 62 refs.
CFSTI: TT 67-51408/5

Particulates of oxides and hydroxides of iron, aluminum, and manganese are abundant in soils. Detailed knowledge about their morphology is presented. One of the main impressions gained from available electron-optical data on the oxides of iron, aluminum, and manganese is the sparseness of the observations. Peculiar similarities and differences in morphology which permeate this series of compounds are noted. Tabulated data indicate that there is often relatively little relationship between external shape and crystallographic symmetry. Morphological similarities in these oxides do not reflect relationships in crystallographic symmetry or vice versa. A more detailed correlation does show distinct similarities for isostructural compounds such as lepidocrocite and boehmite - and for compounds which are prepared in the same manner -e.g., δ-FeOOH and feitknechtite. The only oxides which can possibly be immediately identified from electron-micrographs are boehmite, because of its peculiar morphology, and hematite, because of the particularly sharp characteristic outline of its electron-dense particles. Gibbsite might be guessed at but would require confirmation by other investigational techniques such as electron diffraction. Only few of the compounds can be identified under the electron microscope on the basis of their morphology; it appears that some of them crystallize in more than one form.

M-8263

Loquenz, Heinz
EXPERIENCE AND RESULTS WITH AN INSTRUMENT FOR DETERMINATION OF ELECTRICAL DUST RESISTANCE. STAUB (English translation), 27(5):41-43, May 1967. 1 ref.
CFSTI: TT 67-51408/5

The separation efficiency of an electroprecipitator depends, among other things, on electric dust resistance of the material to be separated. The experimental determination of this magnitude is frequently associated with difficulties; factors influencing the accuracy of measuring results are discussed. The importance of dust resistance in measuring electro-precipitators is shown by resistance-temperature curves for different dusts. (Author's summary)

M-8336

Pfefferkorn, Gerhard and Hans Desler
INVESTIGATING SMOKES GENERATED IN ELECTRIC-ARC WELDING. STAUB (English translation), 27(8):1-3, Aug. 1967. 6 refs.
CFSTI: TT 67-51408/8

Smoke from electrowelding electrodes and different special electrodes was investigated under the electron microscope, by X-rays, and with the help of electron diffraction. Smoke particles of a diameter from 0.01 μm to 1 μm consist of SiO_2 and of metal oxides. Chemical analysis of smoke mainly shows the presence of SiO_2 while TiO_2 almost disappears. Iron oxides Fe_2O_4 and gamma-Fe_2O_3 have been found by X-rays in the original smoke. Metal oxides which disturb the diffraction analysis have been eliminated by a chlorination method. There is no indication that crystalline SiO_2 modifications occur in smoke. (Authors' summary, modified)

M-8337

Naumann, Peter
THE VOLATILITY OF AEROSOLS. STAUB (English translation), 27(8):4-5, Aug. 1967. 5 refs.
CFSTI: TT 67-51408/8

Many organic compounds occurring as suspended matter have a volatility (i.e., the maximum possible vapor concentration) which is many times higher than the maximum allowable concentration value. Although these substances occur in the form of suspended matter, it must be taken into account that they may also be present in the form of gas (vapor). This fact is important in the selection of a suitable respirator. It is proposed, therefore, to give in the MAC list, in the case of these substances, the MAC value not only in mg/m^3 but also in ppm, and to emphasize the necessity of using a combined suspended matter gas filter. (Author's summary, modified)

M-8338

Polydorová, Marie
THE MANUFACTURE AND PROPERTIES OF A PLATINUM OXIDE AEROSOL. STAUB (English translation), 27(8):5-8, Aug. 1967. 13 refs.
CFSTI: TT 67-51409/8

Platinum oxide aerosol formed by electric heating of platinum wire in an air stream only shows small deviations in the particle size distribution. It has been possible to obtain aerosols of an average geometrical particle diameter of 0.018 - 0.048 μ as a function of wire surface temperature and air flow rate.

M-8341

Sundelöf, Lars-Olof
ON THE ACCURATE CALCULATION OF PARTICLE-SIZE DISTRIBUTIONS IN AEROSOLS FROM IMPACTION DATA. STAUB (English translation), 27(8):22-28, Aug. 1967. 3 refs.
CFSTI: TT 67-51408/8

A theory for the calculation of particle size distribution from impaction data is presented. Special attention is given to cascade impactors and the arrangement of steps in such an instrument in order to increase the particle size selectivity. It is shown how the deposited particle distribution is influenced by the earlier steps; a new and very useful quantity called "the apparent impaction efficiency" is introduced. A complete numerical example is given. (Author's summary)

M-8439

Nishchii, R. A. and I. A. Brazgin
ELECTRON DIFFRACTION STUDIES OF THE STRUCTURE OF SMELTING DUSTS. [Primenenie metoda elektronnoi difraktsii dlya izucheniya strukturnogo sostova plavil'nykh pylei.] Hygiene and Sanitation (English translation of: Gigiena i Sanit.), 32(4-6):236-241, April-June 1967. 2 refs.
CFSTI: TT 67-51409/2

A detailed study of the structure of dust by electron diffraction was made. By means of a rotary device, samples were taken directly from the smoke column (above the arc furnace), and from the steelworkers' breathing zone. The diffraction patterns of the samples were studied by electron microscope. The diffraction image is formed because of the wave character of the electrons. When it encounters the lattice atoms, the electron wave is diffracted and reproduces the diffraction of the atoms of chemical compounds on a photographic plate. By electron diffraction and microdiffraction it was possible to determine the composition of industrial dust discharged into the aerial medium from the electric-arc furnaces. Dust generated by the manufacture of refractory alloys and steels consists mainly of compounds with a complex physicochemical structure, including complex silicates of iron, aluminum chromium, manganese, etc. The chemical composition of smelting dust depends upon several factors, such as the grade of steel, the technological process, the smelting stage, etc. With the method proposed for the study of the structural composition of dust, it is possible to apply the electron diffraction method to hygienic investigations.

M-8670

Schönauer, Gerhard
ELECTRON- AND LIGHT-OPTICAL DETERMINATION OF THE FLATTENING FACTOR AND SIZE OF OIL DROPLETS. STAUB (English translation), 27(9):7-13, Sept. 1967. 11 refs.
CFSTI: TT 67-51408/9

When a droplet hits a solid support and flattens to form a spherical segment, the "edge angle" can be calculated from the shape of the cap by the ratio of its base diameter to its height. The size of the original droplet can be calculated from the base diameter of the flattened drop, if the "flattening factor" is known. A method which permits the flattening factor to be determined under the optical microscope and electron microscope is described. The spherically flattened droplets are shaded in vacuum together with small glass spheres at an angle of 3° to 4°. It is possible to calculate the shading angle from the shadow of glass spheres, and the flattening factor and boundary angle of cupolas from the cupola shadow by means of the shading angle.

M-8712L

Steudel, Ralf.
REACTION OF SULFUR TRIOXIDE WITH CARBON DISULFIDE. Z. Anorg. Allg. Chem., Vol. 346, p. 255-265, 1966. Translated from German. Redstone Scientific Information Center, Redstone Arsenal, Ala., RSIC-643, 19p., Feb. 1967. 17 refs.
CFSTI: AD 808646

Carbon disulfide and dry SO_3 at pressures of seven torr and temperatures at 430°C do not react with each other in a flow reactor (dwell time about 0.1 second). In quiescent gas mixtures at pressures of 300 torr and at room temperature, no reaction was found even after 60 minutes. The experiments were made in a heated glass vacuum apparatus with a mercury pump. An inclined tube manometer with sulfuric acid made it possible to determine the mix ratio, which was varied widely; under flow conditions the CO_3:CS_2 ratio ranged from 1:1 to 1:13 and under stationary conditions from 1:2 to 1:600. In the experiments, the amount of sulfur expected did not precipitate in the apparatus, and the gas mixtures (CO_3:CS_2=1:3) condensed in a cold trap at -75°C quantitatively into white a-SO_3 and colorless liquid carbon disulfide. These compounds then slowly reacted on one another at room temperature, evolving gas and turning yellow. In contrast to this, however, yellow to brownish red condensates were obtained when freezing out was done in liquid nitrogen. The reaction observed there first clearly appeared during condensation. The color of the condensates depended on the SO_3:CS_2 ratio and varied from yellow (1:200-600) to orange and brown (1:1-30). Upon melting, the CS_2 - rich condensates scarcely changed their color, while those low in CS_2 at first became dark red (at about -100°C). At room temperature, all condensates consisted of a colorless solution and a solid yellow material. As above, sulfur, SO_2, and COS were found in the colorless solution. The yellow substance was identified from its qualitative behavior and IR spectra as a mixture of SO_3 and C-S-O compounds. The reaction thus proceeded as at room temperature with subsequent formation of S_8 and C-S-O polymers. The amount transformed, in terms of the amount of SO_3 used, was very low.

M-9645

Binek, Bedrich and Blanka Dohnalova
A GENERATOR FOR MANUFACTURE OF MONODISPERSED AEROSOLS FROM THE LIQUID PHASE. STAUB (English translation), 27(11):30-33, Nov. 1967. 6 refs.
CFSTI: TT 67-51408/11

A simple aerosol generator was designed and found to be well suited for calibration of the automatic particle counters. Particle sizes remain constant even after several hours of operation. The instrument is now being further developed to obtain higher concentrations and several particulate fractions. It is intended to apply the generator to the solution of various problems in basic aerosol research and filtration. Simplification and increased accuracy of measurements are attained, particularly due to the constant particle concentration guaranteed by the vibration frequency of the whisker. A further advantage is the possibility of uniform and unipolar particle charging to study the effects of electrical fields in filtration. The generator is also suited to the manufacture of radioactive aerosols from a solution, since it limits the danger of contamination and the quantity of the manufactured aerosol can be metered exactly.

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